ANNUAL REPORT

OF THE COUNCIL

OF THE

YORKSHIRE

PHILOSOPHICAL SOCIETY

FOR THE YEAR

1938

PRESENTED TO THE ANNUAL MEETING,

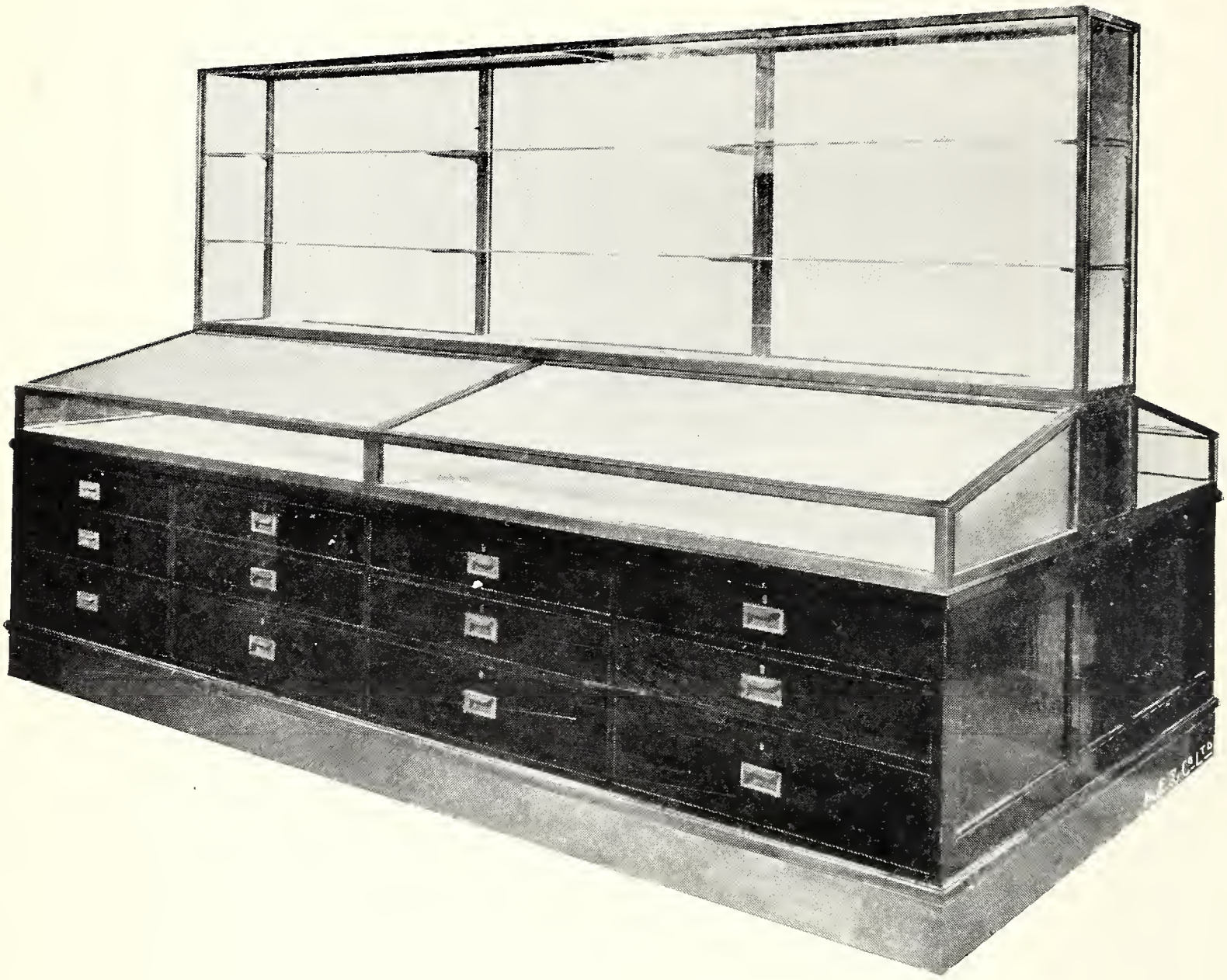
FEBRUARY 13th, 1939.

PRINTED BY ORDER OF THE COUNCIL.

1939.

Issued April 5th, 1939.


BRITISH MUSEUM
NATURAL HISTORY



DOUBLE DESK AND TOWER CASE.

Erected in the Central Hall of the Yorkshire Museum, York, by Messrs. A. Edmonds & Co., Ltd. (Birmingham).

The cost was defrayed by a grant from the Carnegie United Kingdom Trust.

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FORM

OF A

BEQUEST TO THE SOCIETY.

Every person desirous of bequeathing to the Society any sum of Money, Specimens, Books, Instruments, or other Property, is requested to make use of the following form:—

I give and bequeath to the Trustees, for the time being, of the Society established at York, called **"The Yorkshire Philosophical Society,"** *for the use of the said Society, the sum of to be paid out of such part of my personal estate as I may legally charge therewith.* [Or here enumerate the effects or property intended to be bequeathed.] *And I direct that the receipt of the Treasurer of the said Society, for the time being, shall be an effectual discharge to my Executors for the said legacy.*

The Yorkshire Philosophical Society.

(Founded 1822.)

Patroness :

HER MAJESTY QUEEN MARY.

Trustees :

THE RT. HON. THE EARL OF FEVERSHAM.
GEORGE A. AUDEN, M.D., M.A., Ph.D., F.R.C.P.
E. R. DODSWORTH.
SIR FRANCIS W. TERRY, J.P.
J. TRIFFITT.
SIR ROGER LUMLEY, B.A.
GEOFFREY THOMPSON, M.A.
COL. INNES N. WARE, O.B.E.

President :

THE RT. HON. THE EARL OF FEVERSHAM.

Vice-Presidents :

GEOFFREY THOMPSON, M.A., F.S.A.
CHARLES E. ELMHIRST, J.P.
W. HARVEY BROOK.
REV. A. RAINE, M.A.
SYDNEY H. SMITH, J.P., F.Z.S.
J. TRIFFITT.
SIR FRANCIS W. TERRY, J.P.
J. L. BROCKBANK, M.A.
COL. INNES N. WARE, O.B.E.
ALD. W. H. BIRCH, J.P.
JOHN A. COOPER.
ARTHUR HURST.

Council :

CHARLES ALLEN.
E. BAKER.
J. H. COLLINSON, M.A.
K. E. T. WILKINSON, B.A., LL.B.
KENNETH WARD, F.R.I.B.A.
M. DU BOIS FERGUSON, M.D., D.P.H.
COUN. H. E. HARROWELL, J.P.
A. W. PING, M.A.
J. HERVEY RUTHERFORD, F.R.I.B.A.
T. GOULTON LEONARD.
J. A. KNOWLES, F.S.A.
SIDNEY MELMORE, B.Sc.

Hon. Treasurer and Hon. Secretary :

COL. INNES N. WARE, O.B.E., T.D.

Committees :

General Purposes and Finance Committee :

J. L. Brockbank.
W. Harvey Brook.
John A. Cooper.
Arthur Hurst.
T. Goulton Leonard.
Sidney Melmore.
Rev. A. Raine.
Sir Francis W. Terry.
Geoffrey Thompson.
J. Triffitt.
Col. Innes N. Ware.

Garden Committee :

C. Allen.
E. Baker.
J. H. Collinson.
Arthur Hurst.
J. A. Knowles.
A. W. Ping.
K. E. T. Wilkinson.
Dr. Collinge, *Secretary*.

Museum Committee :

Charles Allen.
W. Harvey Brook.
Arthur Hurst.
Sydney H. Smith.
Geoffrey Thompson.
Dr. Collinge, *Secretary*.

Abbey Restoration Committee :

W. Harvey Brook.
John A. Cooper.
Coun. H. E. Harrowell
Rev. A. Raine.
J. H. Rutherford.
Sydney H. Smith.
Sir Francis W. Terry.
Geoffrey Thompson.
J. Triffitt.
Kenneth Ward.
Col. Innes N. Ware.
Dr. Collinge, *Secretary*.

Building Committee :

Ald. W. H. Birch.
J. H. Rutherford.
J. Triffitt.
Kenneth Ward.
K. E. T. Wilkinson.
Dr. Collinge, *Secretary*.

The President, the Hon. Secretary and Hon. Treasurer, and the Keeper are *ex-officio* members of all Committees.

York and District Field Naturalists' Section.

President :
C. F. SWEETMAN.

Vice Presidents :

S. MELMORE.
W. G. BRAMLEY.
E. W. TAYLOR.
V. G. F. ZIMMERMANN.

Hon. Treasurer :
G. MACHIN,
42, Vyner Street, York.

Hon. Secretary :
A. W. PING, M.A.,, F.R.Met.S.
St. Olave's, Clifton, York.

The Annual Subscription to the Section is five shillings. Membership is open to both members and non-members of the Yorkshire Philosophical Society. Members of the Yorkshire Philosophical Society are cordially invited to the lectures.

REPORT OF THE COUNCIL

OF THE

YORKSHIRE PHILOSOPHICAL SOCIETY.

13th FEBRUARY, 1939.

THE restoration of St. Mary's Abbey, started in July, 1936, has been continued. During the past year the nave and chancel, and the archway at the Marygate entrance, have been completed. The eastern portion of the church still awaits attention, but will have to be deferred until further funds are available. At least another £2,000 will be required to complete this work and the wall at the Marygate entrance.

During the crisis in September last, the Town Clerk asked if permission could be granted to the Corporation to prepare trenches in the Museum Gardens for use by the civilian population in the event of war. Your Council, wishing to co-operate with the City Corporation, felt that no objection could be raised to this request, and their decision was conveyed to the Town Clerk. The site was marked out, but fortunately the danger was averted so it was not necessary to proceed further.

Various improvements in the lighting of the Tempest Anderson Hall have been carried out, and a new lantern installed.

The following is a full list of Lectures delivered in the Tempest Anderson Hall during the year.

January 20th.—"Problems of Interplanetary Travel." Frederick Addey, B.Sc., F.R.A.S., M.I.E.E.
Chairman : J. Triffitt.

February 3rd.—"Cyprus—the Enchanted Isle." Mrs. M. McLaughlan, F.R.G.S.
Chairman : A. Wentworth Ping, M.A.

February 17th.—"The Master Mind of Napoleon." The Rev. Canon F. Paton-Williams.
Chairman : Col. Innes N. Ware, O.B.E., T.D.

March 3rd.—"The Falkland Islands : an Outpost of Empire." Mrs. Majorie Roberts.
Chairman : K. E. T. Wilkinson, B.A., LL.B.

October 20th.—"Grey Owl and the Beaver." Harper Cory, F.C.G.S.
Chairman : Geoffrey Thompson, M.A., F.S.A.

November 3rd.—"Uganda : Heart of Africa." Dr. A. T. Schofield, M.A.
Chairman : J. L. Brockbank, M.A.

November 17th.—"These Australians—! " H. Cedric Fenton, F.R.E.S.
Chairman : Col. Innes N. Ware, O.B.E., T.D.

December 1st.—"My Lone Quest in the Land of the Queen of Sheba." Norman Stone Pearn.
Chairman : Ald. W. H. Birch, J.P.

December 15th.—"A Vanished Civilization." A. Stuart McNairn, F.R.G.S.
Chairman : K. E. T. Wilkinson, B.A., LL.B.

FINANCE.—The year opened with a credit balance of £61 6s. 2d. For the year there was an excess of income over expenditure of £60 15s. 3d., and after paying £61 2s. 6d. to the Fabric Fund, and other items, there was a debit balance of £10 4s. 3d. on December 31st.

The Million Shilling Fund stands at £54 17s. 2d., and the Reed Bequest shows a credit balance of £49 13s. 4d.

The "H. J. Wilkinson Memorial Fund" shows a credit balance of £9 17s. 1d.

CHANGES IN STAFF.—Miss Lock who had been Housekeeper since June, 1920, has left, and Mrs. A. E. Pallister has been appointed in her place. Mrs. Pallister took over her duties on May 30th, and her ability is already evident in all departments of the Museum.

Once again the Council wish to place on record their thanks to the Trustees of the British Museum for the many valuable publications presented, especially during 1938.—Warwick Wroth's "Catalogue of the Imperial Byzantine Coins in the British Museum," 2 vols. 1908., and Warwick Wroth's "Catalogue of the Coins of the Vandals, Ostrogoths and Lombards . . . in the British Museum," 1911.

The Keeper of the Museum would like to place on record the thanks of the Society to Mr. R. Doherty, the City Librarian, for the many kindnesses he has shown to us, and to say how glad he is that we have been able to reciprocate this very helpful service.

The Council desire to thank the Honorary Curators for their services during the year, and to place on record their appreciation of the work of the Keeper of the Museum.

The Council deeply regret to have to record the passing of the following members:—Sir James Crichton-Browne, M.D., LL.D., D.Sc., F.R.S., who had been an Honorary Member since 1898; Mr. George Yeld, M.A., who became a member of the Society in 1893, was elected to the Council in 1906, as a Vice-President in 1908, and an Honorary Member in 1922. A further loss is that of Mr. John Scott who became a member in 1917 and acted as a member of the Council from 1921 to 1925, when the claims of business compelled him to resign. Mr. Scott was Honorary Curator in Astronomy from 1917. He frequently lectured before the Society, and took a very deep and personal interest in its welfare.

Mr. W. Eagle Clarke, I.S.O., LL.D., F.R.S.E., had been an Honorary Member since 1923. His work on Bird Migration

had earned him a world-wide fame. He was born in Leeds in 1853, and was thus in his eighty-sixth year at the time of his death. He was educated in his native town, and first took up business there as a land surveyor. His keen love of natural history, however, soon led to his renouncing a business career and to his being offered the Curatorship of the Leeds (Philosophical Society's) Museum, a position he occupied until 1888. In that year he obtained, by special appointment, an Assistant-ship in the Museum of Science and Art, Edinburgh (now the Royal Scottish Museum). He was eventually promoted to the Keepership of the Natural History Department in that Museum, from which position he retired in 1921. For his services in the Museum he was awarded the I.S.O. in 1920, and for his researches in bird-migration the University of St. Andrews conferred upon him the honorary degree of LL.D. He also received the Godman-Salvin medal from the British Ornithologists' Union, of which he was at one time President. He was a past-President of the Royal Physical Society of Edinburgh and of the Yorkshire Naturalists' Union, and an honorary Fellow of many foreign Societies.

A further loss is Col. John W. R. Parker, C.B., D.L., F.S.A., who was elected an Honorary Member in 1934. Col. Parker was President of the Yorkshire Archaeological Society from 1913 to 1938.

By a unanimous vote of the Council Mr. T. D. Kendrick, M.A., F.S.A., Keeper of the British and Mediaeval Antiquities in the British Museum, London, Mr. T. Davies Pryce, M.R.C.S., F.S.A., Sir John Forsdyke, K.C.B., M.A., F.S.A., Director and Principal Librarian of the British Museum, and Mr. John L. Kirk, B.A., M.B., M.R.C.S., Honorary Director of the Castle Museum, York, were elected Honorary Members.

Field Naturalists' Section.—Quiet and persevering work has been continued by members of the Section in various branches of Natural History, and the programme of meetings and excursions has been carried out very successfully.

The sectional Recorders' Reports again show a most interesting and valuable record of observations. Members have also co-operated in the national investigations regarding the numbers and habits of the corncrake.

Notable research work has been done, and is being continued by Mr. E. Yuill and his brother Mr. J. Yuill in connexion with mould fungi. Mr. E. Yuill has been elected a member of the British Mycological Society, and an article

has been published in the transactions of the Society entitled *Cladosarum olivaceum* : a new Hyphomycete.

The Section has suffered the loss by death of several old and valued members, viz., Mr. A. Suggitt, our Hon. Librarian, Mr. T. Allison Booth, Dr. L. A. Johnson, and Mr. John Scott who for so many years had done so much to interest members in astronomical observations.

An unexpected decline in our membership has occurred through the removal of the Geological Survey Office from York to London. This incurs the resignations of five of our members, so that with six other resignations there has been a serious loss to the Section.

We have elected six new members during the year which brings our total membership to 8 Honorary Members, 95 Ordinary Members (a decrease of 9), 11 Student Members and 6 Corresponding Members.

The following Meetings, Lectures and Excursions have been held during 1938 :—

January 12th.—Presidential Address : "The Work of Edward Pigott and John Goodricke." S. Melmore, B.Sc.
January 26th.—Entomological Night. Recorder's Report and Lecture with Exhibits. "The Life History of the Brown-veined Reed Moth." A. Smith.
February 9th.—Lantern Lecture : "Some Birds of the Yorkshire Moorlands." E. W. Taylor.
February 24th.—Botanical Night. Recorder's Report and Lantern Lecture. "A Country Lane." J. H. Evers.
March 10th.—General Exhibit Night.
March 23rd.—Recorders' Reports : Ornithology, V. G. F. Zimmermann. Vertebrate Zoology, S. H. Smith, F.Z.S.
April 6th.—Annual Meeting.
June 1st.—An Evening Visit to Moorlands, near Skelton.
June 8th.—A Visit to "Galtres Edge," Wigginton.
June 15th.—An Evening Visit to Askham Bogs.
June 18th.—A Visit to Everingham Park.
June 22nd.—A Ramble on Heslington Common.
July 2nd.—A Ramble in Elvington Lane.
July 6th.—An Evening Ramble in Sand Hutton Lane.
July 9th.—A Visit to Towton.
July 20th.—An Evening Visit to "Yewcourt," Stockton Lane.
August 6th.—A Ramble from Bilbrough Lane-end.
August 10th.—A Visit to Hutton-le-Hole.
September 2nd.—7th.—Fungus Foray at Hovingham.
September 3rd.—A Visit to Oldstead, near Coxwold.
October 5th.—Lantern Lecture : "From Windermere to Borrowdale." Dr. G. H. Mitchell.
October 12th.—General Exhibit Night.
October 26th.—Lecture with Exhibits and Specimens : "Grasses." Miss C. M. Rob.
November 9th.—Geological Night. Recorder's Report, Notes and Exhibits. J. A. Dell, M.Sc.
November 23rd.—Presidential Address : Lantern Lecture, with Exhibits. "The Tongues of Molluscs." C. F. Sweetman.
December 7th.—Lantern Lecture : "The Micro-Fungi." E. Yuill.

NEW MEMBERS, ELECTED IN 1938.

Cooper, D. H., The Manor School, Marygate.
Cowman, A., 21, Grosvenor Terrace.
Curran, F. B., York House, Coney Street.
Flint, G. F., City Club, York.
Franklin, Owen le P., F.R.C.O., Mus. Bac., 22, Bootham Crescent.
Gladwin, Arthur D., 30, Hobgate, Acomb.
Masser, W. W. F., 97, East Parade, Heworth.
Newman, Mrs. J. B., 4, Bootham Grange.
Parker, Miss L. A. S., Matron, The Purey Cust Nursing Home, York.
Pfluger, Mrs. L., 32, Queen Anne's Road.
Smallpage, F. H., "Strayside," Muncaster, York.
Smith, L. A., 80, Marygate.
Visick, Arthur H., F.R.C.S., 25, Petergate.
Warnes, Raymond, 37, Sycamore Terrace, Bootham.
Wood, The Hon. Charles, M.P., 44, Eaton Square, London, S.W.1.

DEATHS.

HONORARY MEMBERS.

Clarke, Wm. Eagle, I.S.O., LL.D., F.R.S.E., Royal Scottish Museum, Edinburgh.
Crichton-Browne, Sir James, M.D., LL.D., D.Sc., F.R.S., 45, Hans Place, London, S.W.1.
Parker, Col. John, C.B., F.S.A., Browsholme Hall, nr. Clitheroe.
Yeld, George, M.A., Orleton, Gerrards Cross, Bucks.

MEMBERS.

Chapman, F. C., 124, East Parade, Heworth.
Cooper, Wm., Aislaby Hall, Pickering.
Davis, Miss C., 20, Bootham Terrace.
Marston, H. C., "Barbizon," 8, East Parade, Heworth.
Merriman, G. A., 63, Petergate.
Morton, J. H., 17, Sycamore Place.
Oman, Mrs. M. D., 46, Bootham Crescent.
Scott, John, 23, Russell Street, Scarcroft Road.
Suggitt, Wm. A., "Brookside," Norton, Malton.
Walker, Mrs. J. S., 4, Grosvenor Terrace.

LADY SUBSCRIBER.

Dunn, Miss K. E., 18, Sycamore Terrace.

RESIGNATIONS.

Members	13
Lady Subscribers	3
	16

DEATH AND RESIGNATION.

Members	23
Lady Subscribers	4
	27

NEW MEMBERS.

15

TOTAL MEMBERSHIP ON 31st DECEMBER. 1938.

Honorary Members	30
Members	288
Lady Subscribers	25
Associates	4
	347

PAST PRESIDENTS

OF THE

YORKSHIRE PHILOSOPHICAL SOCIETY.

1822-1830. The Rev. William Venables Vernon, F.R.S., F.G.S. (Resigned at Annual Meeting, February, 1831.)

1831-1857. The Viscount Milton, F.R.S., F.S.A. (afterwards became the Earl Fitzwilliam). (See Ann. Rpt. for 1857, p. 15.) (Died 1857.)

1858-1864. The Earl of Carlisle, K.G., F.R.S. (Died 1864.) .

1865-1890. His Grace the Lord Archbishop of York. (William Thomson, F.R.S., F.G.S.) (See Ann. Rpt. for 1890, p. 14.) (Died 1890.)

1892-1906. Sir Charles Strickland, Bart., F.G.S. (Resigned early in 1906.)

1906-1913. Tempest Anderson, M.D., D.Sc. (Died 26th August, 1913.)

1914-1933. William Herbert St. Quïntin, D.L., J.P. (Died January 21st, 1933.)

LIST OF HONORARY MEMBERS.

1. 1879. Berget, Baron A., Sorbonne, Paris.
2. 1906. Bower, F. O., Sc.D., LL.D., F.R.S., 2, The Crescent, Ripon.
3. 1898. Clark, J. E., B.A., B.Sc., Portway, Street, Somerset.
4. 1924. Collingwood, Prof. R. G., M.A., F.S.A., F.B.A., Magdalen College, Oxford.
5. 1906. Cornish, Vaughan, D.Sc., Inglewood, Camberley, Surrey.
6. 1936. Elgee, Frank, Ph.D., 19, Borovere Gardens, Alton, Hants.
7. 1938. Forsdyke, Sir John, K.C.B., M.A., F.S.A., Director and Principal Librarian of the British Museum, London.
8. 1926. Fox, Sir Cyril, Ph.D., F.S.A., Director of the National Museum of Wales, Cardiff.
9. 1920. Grabham, Oxley, M.A., Heron Cottage, Thornton Dale, Yorks.
10. 1923. Harmer, Sir Sidney F., K.B.E., Sc.D., F.R.S., The Old Manor House, Melbourn, near Royston, Herts.
11. 1934. Hill, Sir George Francis, K.C.B., M.A., D.C.L., LL.D., F.S.A., 12, Sussex Place, Regent's Park, London, N.W.1.
12. 1926. Keith, Sir Arthur, M.D., LL.D., F.R.C.S., F.R.S., Buckston Browne Farm, Farnborough, Kent.
13. 1938. Kendrick, T. D., M.A., F.S.A., Keeper of the Department of British and Mediaeval Antiquities, British Museum, London, W.C.1.
14. 1938. Kirk, John L., B.A., M.B., M.R.C.S., F.S.A., Honorary Director of the Castle Museum, York.
15. — Lightfoot, Thomas, Masham, Yorks.
16. 1929. Maclagan, Sir Eric, C.B.E., M.A., F.S.A., Director and Secretary of the Victoria and Albert Museum, London, S.W.1.
17. 1925. Marriott, Sir John A. R., M.A., 17, Belgrave Square, London.
18. 1906. Müller, Sophus, Prindsens Palais, Copenhagen.
19. 1936. Ogden, James R., J.P., F.S.A., F.R.S.A., 38, James Street, Harrogate.
20. 1926. Peers, Sir Charles R., C.B.E., M.A., Litt.D., F.B.A., F.S.A., Chiselhampton House, Stadhampton, Oxford.
21. 1935. Platnauer, H. M., B.Sc., Milton Court Hotel, 68-72, Cromwell Road, London, S.W.7.
22. 1938. Pryce, T. Davies, M.R.C.S., F.S.A., Bramber, Horsellvale, Woking, Surrey.
23. 1927. Regan, C. Tate, M.A., D.Sc., F.R.S., F.L.S., Director of the British Museum (Nat. Hist.), London, S.W.
24. — Sadler, Sir Michael Ernest, K.C.S.I., C.B., D.Litt., LL.D., Master of University College, Oxford.
25. 1906. Shetelig, Dr. Haakon, Bergens Museum, Bergen, Norway.
26. 1924. Smith, Arthur H., C.B., M.A., F.S.A., F.B.A., 2, Balfour Road, Weybridge, Surrey.
27. 1929. Thompson, Professor A. Hamilton, M.A., D.Litt., F.S.A., The University, Leeds.
28. 1930. Wheeler, R. Mortimer, M.C., M.A., D.Litt., F.S.A., London Museum, Lancaster House, London, S.W.
29. 1926. Woods, Henry, M.A., F.R.S., Sedgwick Museum, Cambridge.
30. 1923. Woodward, Sir A. Smith, LL.D., F.R.S., F.G.S., Hill Place, Hayward's Heath, Sussex.

Dr. THE YORKSHIRE PHILOSOPHICAL SOCIETY, GENERAL INCOM

Last Year	EXPENDITURE.	£ s. d.	£ s. d.
	To Rent, Rates and Taxes:		
	Property Tax and City Rates	71 16 1	
	Waterworks Company's Rates	11 8 1	
100			83 4 2
	To Insurance:		
	Fire and Plate Glass	18 4 6	
	Boiler	8 3 0	
	Employers' Liability	5 2 2	
	Fidelity Guarantee	1 5 0	
	National Health and Unemployment ...	36 11 6	
61			69 6 2
	To Salaries and Wages:		
	Museums	1718 5 2	
	Lodge and Gardens	530 1 11	
	Staff Pensions	127 0 0	
2363			2375 7 1
	To General Expenses, Repairs and Renewals:		
	MUSEUMS—		
	Repairs 32 1 4		
	General Expenses 73 11 0		
140		105 12 4	
	GARDENS—		
	General Expenses 86 15 4		
	Bowling Green 32 12 5		
106		119 7 9	
	ESTATE—		
	General Expenses 87 5 11		
94		87 5 11	
340			312 6 0
	To Lighting and Heating:		
109	Coal and Coke	97 12 3	
10	Gas	11 3 2	
64	Electricity	59 11 10	
184			168 7 3
	To Printing and Stationery:		
33	General	21 9 7	
51	Annual Reports and Proceedings	47 13 8	
84			69 3 3
69	**To Lecture Fees**		67 4 0
	To Miscellaneous:		
27	Picture Postcards, etc.		36 13 9
12	Telephone Rent and Calls		13 12 1
15	Postage and Receipt Stamps		14 0 0
			£3209 3 9
	To Balance—Excess of Income over Expenditure		60 15 3
			£3269 19 0
49	To Transfer to Fabric Fund		61 2 6
43	To Additions to Museum		20 6 2
51	To ,, ,, Library		50 17 0
—	To Museum Show-case		199 0 0
			£331 5 8

ID EXPENDITURE ACCOUNT for the Year ended 31st December, 1938. Cr.

Last Year	INCOME.	£ s. d.	£ s. d.
	By Subscriptions :		
	Members	583 2 0	
	County Members	3 0 0	
	Lady Subscribers	26 1 0	
	Associates	4 0 0	
	Ticket Holders (less Refunds)	7 0 0	
	Keys of Gates	60 9 9	
727			683 12 9
	By Bowling Green :		
	Members' Subscriptions	27 10 0	
	Locker Rents and Green Fees	2 19 0	
30			30 9 0
	By Donations :		
	Catholic Pilgrimage	5 0 0	
	York Corporation—Meteorological Grant ...	10 5 0	
15			15 5 0
	By Rents :		
	St. Mary's Lodge	65 0 0	
	Baths Cottage, Marygate	28 12 0	
	Shop, No. 10 Bootham	25 0 0	
	York Diocesan Training College—Boat Yard	5 0 0	
	York Waterworks Co.—Shed	15 0 0	
	Do. Light	1 0	
	St. Olave's Church Council—Light	1 0	
	Mr. Hill—Notice Board	1 0	
	Post Office—Wayleaves	1 2 0	
	York Relay Services (1934) Ltd.—Wayleaves	1 0	
	Garage	5 0 0	
144		144 18 0	
83	Letting of Rooms for Lectures and Meetings	75 15 0	
			220 13 0
424	**By Gate Money**		383 6 11
1914	**By Dividends and Interest** ... ... (for particulars see page 16).		1877 10 3
	By Miscellaneous :		
55	Sale of Picture Postcards, Plans, Reports, etc.		59 2 1
			£3269 19 0
	By Balance brought forward from last year		61 6 2
	By Balance of 1938 Income as above brought down		60 15 3
	By Grant from the Carnegie United Kingdom Trust		199 0 0
	By Balance carried forward		10 4 3
			£331 5 8

Details of Dividends and Interest, 1938, carried into the General Income and Expenditure Account.

DR. TEMPEST ANDERSON BEQUEST.

Capital.			*Net Income.*					
			£	s.	d.	£	s.	d.
£4,314 13s. 2d. 3½% War Stock			151	0	2			
£2,000 4½% Conversion Stock, 1940-44			66	7	6			
£8,000 Dominion of Canada 4% Registered Stock, 1940-60			236	0	0			
£8,000 New Zealand Government 4% Inscribed Stock, 1943-63			236	0	0			
£5,777 2s. 6d. South Indian Railway Co. Ltd., 4% Registered Debenture Stock, 1945 ...			170	8	5			
£5,700 London & North Eastern Railway 4% First Preference Stock			128	5	0			
£2,500 London & North Eastern Railway 4% Second Guaranteed Stock			73	15	0			
£3,219 3s. 5d. Bank of England Stock			284	18	0			
£45 Deposit at Midland Bank, Ltd.				18	0			
Rents of Shops and Dwelling-houses, Nos. 32 & 34, Bootham			65	0	0			
			1,412	12	1			
Income Tax recovered (1937/8)			418	17	0			
						1,831	9	1

MR. RAWDON BEQUEST.

£918 8s. 9d. India 3% Inscribed Stock			20	6	6			
Income Tax recovered (1937/8)			6	17	8			
						27	4	2

MR. ST. QUINTIN BEQUEST.

£247 11s. 2d. 3½% Conversion Stock			6	7	10			
Income Tax Recovered (1937/8)			2	3	2			
						8	11	0
£80 Deposit at Midland Bank, Ltd.						1	12	0
Bank Interest less Commission						8	14	0
						£1,877	10	3

Memo:—The above items are shown less tax, if deducted. Tax so deducted is brought into account in the year in which it is recovered.

THE TREASURER'S ACCOUNT IN CONNECTION WITH THE FUND FOUNDED BY THE LATE WM. REED, ESQ., FOR SPECIFIC PURPOSES, 1938.

Dr. EXPENDITURE.	£	s.	d.
To New Books and Binding	10	16	11
,, Balance carried forward	49	13	4
	£60	10	3

INCOME.	£	s.	d.
By Balance brought forward	36	16	5
,, Interest on £579 12s. 5d. 4% Consolidated Stock, less tax...	17	2	0
,, Income Tax recovered (1937/8)	5	15	10
,, Bank Interest		16	0
	£60	10	3

Cr.

BALANCE SHEET.

	£	s.	d.
Amount of Fund on 31st December, 1938 ...	699	13	4
	£699	13	4

	£	s.	d.
£579 12s. 5d. 4% Consolidated Stock	650	0	0
Balance at Midland Bank, Ltd.	49	13	4
	£699	13	4

Dr. THE H. J. WILKINSON MEMORIAL FUND, 1938. Cr.

EXPENDITURE.	£	s.	d.
To Balance carried forward	9	17	1
	£9	17	1

INCOME.	£	s.	d.
By Balance brought forward	3	5	2
,, Interest on £164 8s. 6d. 4% Consolidated Stock	4	17	1
,, Income Tax recovered (1937/8)...	1	12	10
,, Bank Interest		2	0
	£9	17	1

BALANCE SHEET.

	£	s.	d.
Amount of Fund on 31st December, 1938 ...	194	17	1
	£194	17	1

	£	s.	d.
£164 8s. 6d. 4% Consolidated Stock	185	0	0
Balance at Midland Bank, Ltd.	9	17	1
	£194	17	1

STATEMENT OF FUND.

	£	s.	d.
To Bequest	100	0	0
,, Subscriptions	90	2	0
,, Interest on £164 8s. 6d. 4% Consolidated Stock	8	19	3
,, Bank Interest	2	15	3
	£201	16	6

	£	s.	d.
By £164 8s. 6d. 4% Consolidated Stock ...	185	0	0
,, General Expenses	6	19	5
,, Balance at Midland Bank, Ltd.	9	17	1
	£201	16	6

Dr. ST. MARY'S ABBEY RESTORATION FUND, 1938. Cr.

EXPENDITURE.	£	s.	d.	INCOME.	£	s.	d.
To Balance brought forward	508	11	6	By Subscriptions	8	12	2
,, Repair of Abbey	622	18	11	,, Amount transferred from Fabric Fund ...	61	2	6
,, Bank Interest and Commission	37	18	0	,, Balance carried forward	1099	13	9
	£1169	8	5		£1169	8	5

STATEMENT OF FUND.

	£	s.	d.		£	s.	d.
To Subscriptions—1929 Appeal	432	2	5	By Repair of Abbey	1709	4	6
,, ,, —1935 Appeal	796	5	5	,, Repair of Hospitium	4772 6 1		
,, Champney Bequest	2141	15	7	,, Electric Heating	265 18 0		
,, Proceeds of Sale of Property	1944	12	0	,, Supervisor's Fees	40 10 0		
,, Fabric Fund	567	10	8		5078	14	1
,, St. Mary's Abbey Wall Fund	28	1	10	,, General Expenses—1929 Appeal	48	14	10
,, War Stock Interest	12	7	0	,, ,, ,, —1935 Appeal	55	14	7
,, Profit on Sale of War Stock	3	4	4	,, Bank Interest and Commission	133	5	0
,, Amount due to Midland Bank, Ltd. ...	1099	13	9				
	£7025	13	0		£7025	13	0

Dr. MILLION SHILLING FUND, 1938. Cr.

EXPENDITURE.	£	s.	d.
To Balance carried forward	54	17	2
	£54	17	2

INCOME.	£	s.	d.
By Balance brought forward	53	16	2
„ Bank Interest	1	1	0
	£54	17	2

STATEMENT OF FUND.

	£	s.	d.
To Subscriptions received to 31st December, 1938	970	4	2
„ War Stock Interest	109	9	2
„ Bank Interest, less Commission	21	3	0
„ Profit on Sale of War Stock	0	6	4
	£1101	2	8

	£	s.	d.
By New Cases	880	8	0
„ General Expenses (Printing and Stationery, etc.)	165	17	6
„ Balance at Midland Bank, Ltd.	54	17	2
	£1101	2	8

Dr. FABRIC FUND, 1938. Cr.

EXPENDITURE.	£	s.	d.	INCOME.	£	s.	d.
To St. Mary's Abbey Restoration Fund... ...	61	2	6	By Balance brought forward	1	0	7
„ Bank Interest and Commission		2	0	„ 1/7th Income Tax recovered (1937/8)	61	2	6
„ Balance carried forward		18	7				
	£62	3	1		£62	3	1

STATEMENT OF FUND.

	£	s.	d.		£	s.	d.
To 1/7th Income Tax recovered	552	16	6	By St. Mary's Abbey Restoration Fund ...	567	10	8
„ War Stock Interest	11	0	6	„ Balance at Midland Bank, Ltd.		18	7
„ Bank Interest, less Commission	2	7	0				
„ Profit on Sale of War Stock	2	5	3				
	£568	9	3		£568	9	3

THE YORKSHIRE PHILOSOPHICAL SOCIETY.

LIABILITIES.

	£	s.	d.	£	s.	d.
General Fund.	44,910	0	5 3			
Balance of Income and Expenditure Account (Deficit)	10	4	3			
				44,900	1	0
Subscriptions, paid in advance				11	10	0
Sundry Creditors				46	1	6
				44,957	12	6
Funds for Specific Purposes.						
Mr. Wm. Reed Bequest				699	13	4
The H. J. Wilkinson Memorial Fund				194	17	1
Million Shilling Fund				54	17	2
Fabric Fund					18	7
Overdraft at Midland Bank, Ltd. St. Mary's Abbey Restoration Fund				1,099	13	9
				£47,007	12	5

The Values of the Investments are stated as at the date of acquisition.

The Market Value at 31st December, 1938, was £42,510 3s. 9d.

The properties 32 and 34 Bootham (Dr. Anderson Bequest) and St. Mary's Lodge, Baths Cottage, 10 Bootham, and the properties within the Museum Gardens are not valued for purpose of this Balance Sheet.

GENERAL BALANCE SHEET, 31st December, 1938.

ASSETS.

General Fund.

INVESTMENTS.

DR. TEMPEST ANDERSON BEQUEST.

	£	s.	d.	£	s.	d.
£4,314 13s. 2d. 3½% War Stock	4,163	3	9			
£2,000 4½% Conversion Stock, 1940-44	2,000	0	0			
£8,000 Dominion of Canada 4% Reg. Stock, 1940-1960	7,904	7	0			
£8,000 New Zealand Govt. 4% Inscribed Stock, 1943-63	7,968	14	6			
£5,777 2s. 6d. South Indian Railway Co. Ltd., 4% Regd. Deb. Stock, 1945	5,400	0	0			
£5,700 L. & N.E. Railway 4% 1st Prefce. Stock... } £2,500 L. & N.E. Railway 4% 2nd Guar. Stock ... }	8,131	9	0			
£3,219 3s. 5d. Bank of England Stock	7,967	11	0			
Deposit at Midland Bank, Ltd.	45	0	0			
				43,580	5	3

MR. RAWDON BEQUEST.

£918 8s. 9d. India 3% Inscribed Stock				1,000	0	0

MR. ST. QUINTIN BEQUEST.

£247 11s. 2d. 3½% Conversion Stock				250	0	0
Sundry Debtors...				27	13	0
Balance at Midland Bank, Ltd.: Deposit Account				80	0	0
do. Current Account				19	14	3
				44,957	12	6

Funds for Specific Purposes:

MR. WM. REED BEQUEST.

£579 12s. 5d. 4% Consolidated Stock	650	0	0			
Balance at Midland Bank, Ltd.	49	13	4			
				699	13	4

MR. H. J. WILKINSON MEMORIAL FUND.

£164 8s. 6d. 4% Consolidated Stock	185	0	0			
Balance at Midland Bank, Limited	9	17	1			
				194	17	1
Balance at Midland Bank, Ltd. (Million Shilling Fund)...				54	17	2
Balance at Midland Bank, Ltd. (Fabric Fund) ...					18	7
St. Mary's Abbey Restoration Fund (Deficit) ...				1,099	13	9
				£47,007	12	5

REPORT OF THE AUDITORS TO THE MEMBERS OF THE YORKSHIRE PHILOSOPHICAL SOCIETY.

We have examined the foregoing Balance Sheet and Income and Expenditure Accounts with the Books and Vouchers of the Society, and certify the same to be in accordance therewith. We have verified the Cash Balances and Investments.

8, Coppergate, York.
30th January, 1939.

PULLEYN, CREER & CO.,
Chartered Accountants.

The Yorkshire Museum,

YORK.

Report

of the

Museum Committee

FOR THE YEAR 1938.

PRINTED BY ORDER OF THE COUNCIL.

1939.

THE YORKSHIRE MUSEUM,

YORK.

Keeper:
WALTER E. COLLINGE, D.Sc., M.Sc., F.S.A., F.L.S.,
M.B.O.U., HON. F.R.H.S.

Honorary Curators:

ARCHÆOLOGY - - - W. HARVEY BROOK.

BOTANY - - - - - CHARLES ALLEN.

ZOOLOGY - - - - SYDNEY H. SMITH, J.P., F.Z.S.

NUMISMATICS - - - GEOFFREY THOMPSON, M.A., F.S.A.

CERAMICS - - - - ARTHUR HURST, A.K.C.

Assistants: MISS E. HOLMES. FRANCIS T. G. WHITE.

Chief Clerk: ARTHUR COLLEY.

Museum Attendant:
WILLIAM RAFTON.

Hospitium Attendant:
MISS G. FISHER.

THE YORKSHIRE MUSEUM.

REPORT FOR THE YEAR 1938.

ALTHOUGH there has been a slight falling off in the number of visitors, the work of the Museum has progressed favourably.

The Yorkshire Numismatic Society held its Summer Meeting in the Museum on July 23rd.

The Yorkshire Architectural and York Archaeological Society continues to hold its meetings and house its Library in the Museum.

The Yorkshire Federation of the Museums Association held a meeting in the Museum on October 29th.

EDUCATIONAL WORK.—During the year 665 children from Schools in the City attended the Museum for study and instruction. Loans of specimens have been made to various Schools.

The Collections or Specimens have been studied by :— Miss D. H. Rayner, Sedgwick Museum, Cambridge ; T. S. Westoll, B.Sc., The University, Aberdeen ; Hans Elsaas, Tromso ; A. Phillipson, Knaresborough ; D. Owen Pawson, Morley ; G. F. Wilmot, Ampleforth ; S. Burr, M.Sc., The University, Leeds ; J. R. C. Hamilton, Downing College, Cambridge ; Gordon Ward, M.D., F.S.A., Sevenoaks ; James Wright, F.R.S.E., Edinburgh ; L. R. Cox, M.A., F.G.S., British Museum (Nat. Hist), London ; Prof. Herbert Maryon, King's College, Newcastle-on-Tyne ; Miss A. Robertson, Glasgow University ; Alfred Forrest, Harrogate ; V. A. Eyles, H.M. Geological Survey, Edinburgh ; William Garner, Hull ; G. H. Wailes, London ; F. H. Greenhill, M.A., London ; Peter J. Seaby, London ; A. K. Harbottle, York ; Miss N. Hey, Helperby ; Miss H. E. Donovan, Cirencester.

During the year a new exhibition case has been erected in the Central Hall. The acquisition of this has been made possible by a Grant from the Carnegie United Kingdom Trust of £199. The Council wish to place on record their very best thanks to the Trust for this very generous donation.

Turning to the different departments of the Museum:

Ethnology.—A certain amount of duplication has been corrected, thus allowing a better display of the specimens on exhibition. A number of interesting York finds, principally Danish, have been added to the Collection. The majority of the cases have been given a new background of cream colour which, in spite of the very overcrowded condition of the specimens, has materially added to their attraction from an exhibitional standpoint.

Roman Antiquities.—A number of changes have been made in the arrangement of the Collections. The addition of two desk cases from the general museum has enabled us to exhibit the collection of Roman Glass and some special pieces of Samian ware. A number of additions have been made to the Collection.

Geology.—All the Collections on exhibition have been carefully examined and cleaned. There is still considerable work to be done on the cabinet Collections.

Many of the fine Ammonites, which for many years past have been stored on the tops of the cases in the Geological Galleries, have been cleaned and exhibited on the floor of the large wall case in the Saurian Gallery, and now show to great advantage.

Dr. W. J. Arkell continues to work on our Collection of Ammonites, and Mr. James Wright, F.R.S.E., on the Collection of Crinoids.

Botany.—All the specimens in the Herbarium have been maintained in good order, as also the H. J. Wilkinson Memorial Library.

The Gardens.—Numerous new flowering shrubs have been planted, replacing older and worn-out specimens. Two of the elm trees, both a source of danger, have been lopped.

Zoology.—There have been no additions to the collections during the year, and it is a matter for regret that so little interest is shewn in this section by local zoologists.

The Museum Staff have carefully examined all the specimens both in cases and cabinets, and they have been cleaned and kept in good order.

Several interesting birds have been observed in the district, and they have passed on alive to delight the eyes of other naturalists, whereas in earlier years a gun cracked and a specimen was added to our collections.

Our Very Reverend Dean of York helped a fallen Heron to liberty at Skipwith. I myself cared for a young Gannet and eventually arranged its release on the sea at Scarborough.

A pair of Montagues Harriers were observed at Heslington by Mr. E. Wilfred Taylor and myself, and to the best of our knowledge they still live. Other interesting notes have been made, and details will be found in the Field Naturalists' Section report.

NUMISMATICS.—During the past year further progress has been made in re-arranging and re-labelling the collections, and exchanging duplicates. It is hoped that next year this work will be completed.

A number of coins have been found in building operations and demolitions, and the Society has been able to acquire some of these by gift or purchase. The local finds include coins of Domitian, Trajan, Faustina I, Julia Domna, Victorinus, Diocletian, Constantine I, Licinius I, Edward I (York Groat), Henry VI (gold quarter noble), Henry VIII (Wolsey half groat), James I (Shilling, 2nd coinage).

Amongst presentations, the Society is specially indebted to the Trustees of the British Museum for the Catalogues of Imperial Byzantine Coins, and of Coins of the Vandals, Ostrogoths and Lombards, and of the Empires of Thessalonica, Nicaea and Trebizond, in the British Museum.

By exchange of duplicates the collection has been improved by the addition of some York-minted coins and tokens.

The Medal collection has received some welcome gifts. It is hoped that it may be possible to form a collection of Military Medals. At present this important department of medals is scarcely represented at all in the Society's collections, and gifts would be gratefully received.

The Bank Note collection has now risen to nearly 50 specimens in all, mostly of the old Yorkshire Private Banks,

and includes some interesting contemporary forgeries, but the series is as yet by no means complete. Some of the specimens which were very battered and frail have now been skilfully repaired by the kindness of the British Museum. It is intended to arrange these properly for inspection.

The Society would always welcome early news of any finds of coins in the district.

CERAMICS.—The Ceramic Collections in the Museum have been maintained in good order during the past year. The Green-Glazed Pottery Case has been cleaned, as also the specimens. There have been a few additions during the year of pieces found locally.

LIBRARY.—There has been an expenditure of £50 17s. 0d. on the Library during the year. This includes £8 5s. 6d. on the purchase of new books; £36 18s. 0d. on periodicals, and £5 13s. 6d. on binding. In addition to this £10 16s. 11d. has been expended on books which have been paid for out of the Reed Bequest.

During the year 51 volumes have been added by purchase and 53 by presentation, in addition to the usual unbound memoirs.

The number of volumes borrowed was 183.

METEROLOGY.—Early in the year, by arrangement with the City Engineer, a "Natural Syphon" Rain Gauge was installed in the Gardens. "This is a type of gauge which automatically syphons after each 0.5 inch of rainfall, and does not require hand operation of the syphon. The rain is collected in a 6 inch diameter funnel and is led through a pipe to a float chamber, where it is recorded by a float mechanism. As the float rises, the pen attached to the float rod traces the record on a clock-driven chart. When the pen reaches the top of the chart for 0.5 inch rainfall, the syphon automatically comes into action and discharges the gauge rapidly. The pen falls to the bottom of the chart and the cycle is repeated."

The charts are copied in the City Engineer's Office and the originals filed in the Museum in a specially prepared book, very kindly supplied by the City Corporation.

Your Council wish to express their best thanks to the City Corporation for an Annual Grant of £5 5s. 0d.

The Society's records (which cover a period of 98 years) have been consulted by a large number of people, and reports have been supplied to Railway Companies, Manufacturers, Medical Officers of Health, Solicitors, and many private individuals.

Statistics of Station: Longitude 1° 5'W.; Latitude 55° 57'N.; height above mean sea level 56 feet.

The rainfall for 1938 was above normal, being 25.44 inches, 1.24 inches above the average for the preceding 50 years. The wettest months of the year were December, May and October, when the totals for the months were 4.01, 3.35 and 3.15 inches respectively. April, March and February were the driest months with 0.10, 0.26, and 1.26 inches respectively.

Temperature ranged from 77° F. on August 6th, 9th, and 10th, to 22° F. on December 20th; the range of temperature for 1938 being thus: 55° F. as against 61° F. in 1937. A mean pressure of 1015.1 millibars (1,000 millibars = 29.531 inches of mercury) at M.S.L. (corrected for diurnal variations) has been recorded as against 1012.5 millibars for 1937. November gave the lowest mean for the year 1006.9 millibars, January next with 1007.8 millibars. April was highest 1027.3 millibars, and February next with 1024.9 millibars The extreme range was 2.188 inches as compared with 2.025 inches in 1937. The highest reading of the barometer was taken April 10th at 9-0 p.m. viz.; 30.786 inches, and the lowest on November 23rd at 9 a.m., viz.; 28.598 inches.

Snow or rain fell to the amount of 25.44 inches or 646.2 mm., as against 28.46 inches or 723.0 mm. for 1937, a decrease of 3.02 inches or 76.8 mm. for the year. The heaviest fall of the year occurred on May 29th when 1.08 inches or 27.4 mm. fell.

Observations of Winds show that during 1938 we had "gale force" on one day (force 8 on scale 0-10), "strong" winds on 26 days (force 4-7) as against 4 in 1937, and "calm" on 2 days, 3 days less than 1937. The chief winds have been observed as S.(115), W.(90), N.(80), N.W.(30), S.W.(29), and S.E.(8).

Thunder was heard on 7 days, snow or sleet fell on 7 days, as against 23 days in 1937; and there were hailstorms on 2 days, the same as in the previous year.

Bright Sunshine was recorded 1340.4 hours as against 1152.4 hours in 1937, an increase of 188 hours for the year. The daily mean was 3.67 hours, and the percentage of possible sunshine 30, as against 26 in 1937.

It is urgently requested that any discovery of Archaeological interest in the neighbourhood may be brought to the notice of the Keeper of the Museum, or the Honorary Curators, as early as possible.

The Keeper of the Museum will be pleased to give any information in his power, and may be seen daily, Museum engagements permitting.

LIST OF SCHOOLS

AND OTHER ORGANIZATIONS THAT HAVE VISITED THE MUSEUMS DURING 1938.

Feb. 28th.—Middlesbrough High School.
March 18th—School of Art, Hull.
March 26th—Ardsley School, Wakefield.
April 19th—St. Aidan's School, Leeds.
April 21st—Linthwaite Church School.
April 22nd—Northern Police Orphanage.
May 18th—Ashbourne Road Junior Girls' School.
May 19th—Colton School, Leeds.
May 21st—Kirk Balk Girls' School, Barnsley.
May 21st—Bingley Training College.
May 24th—Students' Convent High School, Doncaster.
May 26th—St. Robert's School, Harrogate.
May 26th—Archbishop Holgate's School, Hemsworth.
May 26th—Sunderland Secondary School.
May 26th—Moor Monkton School.
May 26th—Broughton Hall High School.
May 31st—Fridaythorpe School.
June 1st—Woodland Senior School, Shipley.
June 7th—St. Joseph's Central School, Victoria Park, Manchester.
June 11th—Lambert St. Methodist Church, Hull.
June 11th—Barton-on-Humber School.
June 16th—Rossington Secondary Boys' School.
June 17th—Mixed School, Todmorden.
June 18th—Waterloo Grammar School.
June 18th—Batley Grammar School.
June 20th—Bromley Broad Lane Church School.
June 21st—Society of Antiquaries, Newcastle-on-Tyne.
June 22nd—Long Sutton Senior School.
June 22nd—St. Luke's School, Holbeach.
June 22nd—Pinchbeck School, East Spalding.
June 22nd—Whaplode School, Spalding.
June 22nd—Gadney School, Holbeach.
June 24th—Minster Boys' School, Beverley.
June 24th—Minster Girls' School, Beverley.
June 24th—Chesterfield High School.
June 30th—Members of the Inner Wheel.
June 30th—Keighley Girls' Grammar School.
July 1st—New Seaham Council School.
July 1st—West Kirby C.E. Senior School.
July 2nd—Central School for Girls, Dewsbury.
July 5th—Council School, Stanningley.
July 6th—Yorkshire Federation of Builders.
July 7th—Bushfield Boys' School, Doncaster.
July 8th—Thorpe Modern School, Bradford.
July 9th—Brookfoot School, Brighouse.
July 9th—Students Party from Basle.
July 9th—Southdown Party (Brighton).
July 9th—Faculty of Teachers in Commerce.
July 9th—Nottingham Adult Education.
July 14th—Huddersfield College.
July 14th—Immingham Women's Flower Guild.
July 16th—High School, Barnsley.
July 18th—Greystones Int. School, Sheffield.
July 18th—The Boulevard School, Hull.
July 19th—Burneston C. of E. School, Bedale.
July 21st—Whitcliffe Mount Grammar School, Cleckheaton.
July 22nd—Harrogate College.
July 23rd—Wharram School.
July 23rd—Ripley Co-op Men's Guild.
July 28th—Southdown Party (Brighton).

July	28th—Rothbury School.
July	29th—Party of Danish Schoolboys.
July	29th—O.T.C.
Aug.	1st—Canadian Undergraduates.
Aug.	5th—English-Speaking Union Party.
Aug.	19th—Pickering Scouts' Association.
Sept.	16th—Liverpool Schools.
Sept.	17th—E. Marsden and Party, Ripon.
Sept.	17th—Thoresby Society, Leeds.
Sept.	24th—Kirby Secondary School, Middlesbrough.
Oct.	1st—Otley Archaeological and Historical Society.
Oct.	22nd—Students from Hull University College.
Nov.	1st—Gilling Castle Church School.
Nov.	5th—Northern Federation of Cathedral Old Choir Association.
Dec.	10th—University College, Hull, Sessional Class.

CLIMATOLOGICAL SUMMARY—THE YORKSHIRE MUSEUM, YORK, 1938.

Height above Ground :—Thermometers 4 ft. Rain-gauge 1 ft.

1938.	Air Temperature in Degrees Fahrenheit.											Earth Temperature		Rainfall.					Weather.						Bright Sunshine.		
	Means of		Means of Max. + Min.	Absolute Extremes.								At 1 ft.	At 4 ft.	Total.		Maximum Fall.		Day.	Number of Days of						Total.	Daily Mean.	Percentage.
	Max.	Min.		H. Max.	Day.	L. Min.	Day.	L. Max.	Day.	H. Min.	Day.								Precipitation 0.2 mm. or more.	Precipitation 1 mm. or more.	Snow.	Snow Lying.	Hail.	Thunderstorm.			
	°F.	°F.	°F.	°F.		°F.		°F.		°F.		°F.	°F.	in.	mm.	in.	mm.								hr.	hr.	
Jan.	46.9	37.6	42.3	54	31	31	11	37	10	46	23, 24	39.6	42.4	2.15	54.6	0.27	6.9	8	20	13	0	0	0	0	47.3	1.53	19
Feb.	47.2	37.5	42.3	56	28	30	17	41	15	47	4	40.1	42.5	1.26	32.0	0.56	14.2	26	8	6	2	1	0	0	63.2	2.26	23
March	56.8	41.6	49.2	62	11, 20	32	23	49	26	53	30	44.9	44.1	0.26	6.6	0.14	3.6	26	4	2	0	0	0	0	122.9	3.96	34
April	54.3	38.9	46.6	64	12	28	12	46	17	50	1	47.1	46.4	0.10	2.5	0.08	2.0	4	3	1	0	0	0	0	137.4	4.58	33
May	60.4	43.2	51.8	70	14	30	8	50	18	57	15	51.8	49.1	3.35	85.1	1.08	27.4	29	14	10	0	0	1	1	180.6	5.83	37
June	65.8	50.4	58.1	75	17	42	11	53	2	61	24	56.6	52.7	2.47	62.7	0.66	16.8	10	15	12	0	0	0	0	182.2	6.07	36
July	66.4	52.7	59.5	76	31	46	1, 2	56	16	62	31	59.0	55.5	2.33	59.2	0.44	11.2	16	14	12	0	0	0	2	147.9	4.77	29
August	68.6	53.2	60.9	77	6,9,10	41	23	57	28	61	8	61.6	58.3	2.15	54.6	0.33	8.4	28	15	12	0	0	1	3	164.8	5.32	36
Sept.	64.0	50.2	57.1	73	23	38	15	59	3, 20	61	13	57.8	57.1	1.66	42.2	0.31	7.9	24	20	13	0	0	0	1	118.3	3.94	31
October	56.3	44.6	50.5	65	13	35	27	49	25	54	13	51.7	54.5	3.15	80.0	0.77	19.6	3	18	14	0	0	0	0	89.9	2.90	28
Nov.	52.7	42.9	47.8	62	5, 13	33	22	43	29	58	13	47.7	51.0	2.55	64.8	0.69	17.5	25	19	12	0	0	0	0	55.3	1.84	22
Dec.	44.2	36.2	40.2	52	12	22	20	29	20	45	10, 12	41.3	46.3	4.01	101.9	0.53	13.5	31	23	16	5	8	0	0	30.6	0.99	13
Totals	683.6	529.0	606.3	—	—	—	—	—	—	—	—	599.2	599.9	25.44	646.2	—	—	—	173	123	7	9	2	7	1340.4	43.99	—
Means	57.0	44.1	50.5	—	—	—	—	—	—	—	—	49.9	50.0	—	—	—	—	—	—	—	—	—	—	—	3.67	3.67	30

CLIMATOLOGICAL SUMMARY—THE YORKSHIRE MUSEUM, YORK, 1938.

Latitude 53° 57′ N. Longitude 1° 5′ W. Height above Mean Sea Level 56 ft.

1938.	Mean Pressure corrected to 32° F. and lat. 45° and reduced to Mean Sea Level.				Air Temperature		Humidity.						Mean Amount of Cloud, 0-10		Cloud Amount, 9 a.m.					Wind, No. of Observations, 9 a.m.											
							Depression of Wet Bulb.		Vapour Pressure.		Percentage.				No. of Observations.					(Beaufort Scale).					Direction.							
	9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	0	1-3	4-6	7-9	10	8 or more.	6-7	4-5	1-3	Calm.	N	NE	E	SE	S	SW	W	NW
	mb.	mb.	in.	in.	° F.	° F.	° F.	° F.	mb.	mb.	%	%																		
Jan.	1007.8	1008.2	29.76	29.77	41.2	42.0	1.9	2.0	7.3	7.5	83	83	6.5	6.5	5	4	4	5	13	0	2	1	28	0	5	0	0	2	10	3	9	2
Feb.	1024.7	1024.9	30.26	30.27	41.0	41.7	2.7	2.7	6.6	6.8	77	77	7.4	7.5	3	3	2	5	15	0	1	1	26	0	12	0	2	3	4	2	4	1
Mar.	1021.9	1022.2	30.18	30.19	48.1	48.1	3.1	3.4	8.8	8.6	77	75	6.5	3.2	3	8	1	7	12	0	0	4	27	0	0	0	0	0	11	2	16	2
April	1027.3	1027.0	30.34	30.33	47.2	45.1	4.7	3.8	7.2	7.1	65	69	6.3	4.8	5	6	1	5	13	0	0	1	29	0	17	1	0	0	1	1	3	7
May	1014.9	1014.4	29.97	29.96	52.5	50.4	4.8	3.8	9.1	9.1	67	73	6.9	5.2	3	5	3	10	10	0	0	0	31	0	6	3	2	0	14	0	3	3
June	1014.4	1014.4	29.96	29.96	58.9	57.2	5.3	4.2	11.6	11.9	68	74	6.9	6.7	1	6	3	11	9	0	0	3	27	0	2	0	0	0	9	3	14	2
July	1012.6	1013.1	29.90	29.92	59.8	58.8	4.5	3.4	13.0	13.5	74	80	7.0	6.6	1	6	5	7	12	0	0	3	28	0	4	0	0	2	6	6	10	3
Aug.	1015.5	1015.3	29.99	29.98	60.1	59.0	3.3	2.9	14.3	14.1	80	83	6.9	5.3	2	5	5	7	12	0	0	3	28	0	16	0	0	0	7	1	4	3
Sept.	1015.8	1015.6	30.00	29.99	56.7	56.4	2.6	2.1	13.1	13.5	83	87	7.2	6.8	2	5	4	6	13	0	0	1	28	1	11	0	0	0	10	1	5	2
Oct.	1008.4	1008.8	29.78	29.79	50.0	48.9	2.3	2.0	10.3	10.0	84	85	6.9	4.2	2	7	3	6	13	1	0	5	24	1	1	0	0	0	10	8	8	3
Nov.	1007.1	1006.9	29.74	29.73	46.9	47.3	1.8	1.7	9.4	9.6	86	86	5.5	5.1	1	12	3	7	7	0	0	1	29	0	0	0	0	1	18	2	8	1
Dec.	1010.7	1010.4	29.85	29.84	38.4	39.9	1.4	1.5	6.8	7.2	86	86	6.8	6.8	3	7	1	5	15	0	0	0	31	0	6	0	3	0	15	0	6	1
Totals	12181.1	12181.2	—	—	600.8	594.8	38.4	33.5	117.5	118.9	930	958	80.8	68.7	31	74	35	81	144	1	3	23	336	2	80	4	7	8	115	29	90	30
Means	1015.1	1015.1	29.98	29.98	50.1	49.6	3.2	2.8	9.8	9.9	77	80	6.7	5.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Pressure is expressed in millibars (1,000 millibars = 29·531 mercury inches), also in mercury inches.

Month.	Bright Sunshine.			Pressure at Mean Sea Level.					
	Daily Mean. 1938.	Per-centage.		Absolute Extremes.					
		1937.	1938.	Highest.	Date.	Time.	Lowest.	Date.	Time.
	hr.			mb.			mb.		
Jan.	1.53	11	19	1035.3	3rd	9 a.m.	972.1	9th, 15th	9 a.m.
Feb.	2.26	24	23	1038.8	19th	9 p.m.	986.4	1st	9 a.m.
Mar.	3.96	23	34	1039.5	4th	9 p.m.	1004.6	21st	9 a.m.
Apr.	4.58	19	33	1042.6	10th	9 p.m.	1007.2	2nd	9 p.m.
May	5.83	34	37	1028.5	22nd	9 a.m.	994.1	30th	9 a.m.
June	6.07	32	36	1028.1	16th	9 p.m.	985.5	28th	9 p.m.
July	4.77	26	29	1022.2	31st	9 p.m.	1000.1	5th	9 a.m.
Aug.	5.32	36	36	1029.2	1st	9 p.m.	995.3	19th	9 a.m.
Sept.	3.94	34	31	1027.6	9th	9 p.m.	1002.2	20th	9 p.m.
Oct.	2.90	17	28	1026.2	20th	9 a.m.	975.0	4th	9 a.m.
Nov.	1.84	20	22	1030.4	15th	9 a.m.	968.3	23rd	9 a.m.
Dec.	0.99	12	13	1033.4	25th	9 a.m.	984.7	1st	9 a.m.
Y ear.	43.99 3.67	26	30	1042.6	April 10th	9 p.m.	968.3	Nov. 23rd	9 a.m.

RAINFALL IN 1938 AT CHERRY HILL, YORK.

Rain Gauge: Dia. of Funnel, 5 in.;
Height above Ground, 1 ft. 6 in.
,, ,, Sea level, about 50 ft.

Month.	Total Rain-fall for month.	Days with .01 in. or more.	Days with .04 in. or more.	Date of Highest Rainfall	Amt. in ins.
Jan.	2.06	11	10	11	.45
Feb.	1.60	5	5	26/27	.98
Mar.	0.26	2	2	24	.11
April	0.07	2	1	9	.04
May	3.07	10	8	28/29	1.65
June	2.69	16	9	10	.68
July	2.26	14	13	17	.44
Aug.	2.07	14	12	27/28	.63
Sep.	1.60	23	16	24/25	.32
Oct.	3.14	20	15	3	.74
Nov.	2.56	18	13	25	.65
Dec.	2.48	16	10	13	.35
Total	23.86	151	114		

RIVER HEIGHT RECORDS REGISTERED BY THE AUTOMATIC RECORDER AT THE GUILDHALL, YORK, 1938.

Date.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.	
	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.
		ft. in.		ft. in.		ft. in.		ft. in.		ft. in.		ft. in.
1	4 p.m.	above 0 8	12 p.m.	above 5 8	9 a.m.	above 4 7	1 a.m.	above 0 10	2 p.m.	below 0 5	12 p.m.	above 1 8
2	2 p.m.	0 8	11 a.m.	6 0	1 a.m.	3 4	2 p.m.	0 6	noon	0 1	,,	7 4
3	12 p.m.	0 7	1 a.m.	4 6	noon	1 9	3 p.m.	1 11	7 a.m.	0 4	2 a.m.	7 5
4	,,	0 9	,,	3 7	2 p.m.	1 5	1 a.m.	1 8	,,	0 3	1 a.m.	4 2
5	,,	0 9	,,	2 3	,,	1 3	,,	0 8	8 a.m.	0 2	noon	1 5
6	2 a.m.	0 10	2 p.m.	1 10	noon	1 0	3 p.m.	0 5	,,	0 3	,,	0 9
7	12 p.m.	1 9	1 a.m.	1 5	,,	1 0	,,	0 3	,,	0 4	2 a.m.	0 10
8	11 a.m.	3 4	8 p.m.	1 3	,,	0 10	7 p.m.	0 2	4 p.m.	0 5	3 p.m.	0 11
9	12 p.m.	2 8	2 p.m.	1 3	2 p.m.	0 10	4 p.m.	0 3	noon	S.L.	1 a.m.	0 10
10	noon	3 3	12 p.m.	2 2	3 p.m.	0 9	3 p.m.	0 5	7 a.m.	below 0 4	12 p.m.	0 7
11	1 a.m.	2 3	8 a.m.	2 6	6 p.m.	0 8	noon	0 1	8 a.m.	0 4	,,	0 7
12	12 p.m.	2 0	1 a.m.	1 8	,,	0 8	,,	S.L.	7 a.m.	0 4	4 p.m.	0 8
13	,,	6 6	5 p.m.	1 4	3 p.m.	0 8	,,	below 0 2	8 a.m.	0 3	2 p.m.	0 5
14	1 a.m.	6 6	1 a.m.	1 2	9 p.m.	0 7	,,	0 1	,,	0 4	noon	0 3
15	12 p.m.	7 4	noon	1 1	1 p.m.	0 7	9 a.m.	0 2	noon	0 4	,,	0 3
16	,,	9 9	,,	1 0	,,	0 6	10 a.m.	above 0 1	10 p.m.	above 0 2	,,	0 2
17	6 p.m.	11 0	,,	0 11	3 p.m.	2 7	4 p.m.	0 2	12 p.m.	0 1	4 p.m.	0 3
18	1 a.m.	10 8	,,	0 10	1 a.m.	1 11	3 a.m.	below 0 4	,,	0 3	7 p.m.	0 3
19	,,	6 1	,,	0 9	5 p.m.	1 2	noon	0 1	,,	0 5	3 p.m.	0 5
20	12 p.m.	3 10	3 p.m.	0 10	12 p.m.	1 9	,,	0 1	noon	0 5	12 p.m.	0 3
21	10 a.m.	2 5	noon	0 9	5 a.m.	1 11	,,	0 2	9 a.m.	0 2	4 p.m.	0 3
22	Recorder		,,	0 9	3 p.m.	1 3			noon	below 0 3	,,	0 3
23	out	of order	7 p.m.	0 8	1 a.m.	1 1			,,	S.L.	6 p.m.	0 2
24	noon	2 5	5 p.m.	0 8	noon	0 6			7 a.m.	below 0 4		
25	12 p.m.	2 4	11 p.m.	0 8	12 p.m.	0 9	River		8 a.m.	0 3		
26	10 a.m.	4 0	12 p.m.	0 8	3 p.m.	1 1	drawn off		7 a.m.	0 3		
27	noon	2 9	,,	4 3	,,	0 9			8 a.m.	0 4	Recorder	
28	1 a.m.	2 0	4 a.m.	4 6	6 p.m.	0 8			7 p.m.	above 0 3	dismantled	
29	9 p.m.	4 5			noon	0 5	8 a.m.	below 0 3	12 p.m.	2 1	for cleaning	
30	1 a.m.	4 4			8 p.m.	1 1	,,	0 3	6 a.m.	2 3		
31	12 p.m.	3 0			1 a.m.	0 11			9 a.m.	2 9		

RIVER HEIGHT RECORDS.—Continued.

Date.	JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.
		ft. in.		ft. in.		ft. in.		ft. in.		ft. in.		ft. in.
1	Out of order		1 a.m.	above 2 0	4 a.m.	above 0 7	8 p.m.	above 0 11	12 p.m.	above 3 8	12 p.m.	above 7 6
2	8 a.m.	above 1 6	4 a.m.	1 0	1 a.m.	0 6	6 p.m.	0 11	4 a.m.	3 11	1 p.m.	9 4
3	noon	1 2	9 p.m.	0 7	6 a.m.	0 5	1 a.m.	0 10	,,	4 0	1 a.m.	8 7
4	1 a.m.	1 0	1 a.m.	0 6	5 p.m.	0 8	12 p.m.	10 9	12 p.m.	4 0	,,	5 1
5	1 p.m.	0 6	6 a.m.	0 5	noon	0 4	noon	11 7	4 a.m.	4 2	11 p.m.	7 9
6	noon	0 5	5 p.m.	0 11	,,	0 3	1 a.m.	11 5	3 p.m.	2 6	1 a.m.	7 8
7	6 p.m.	0 7	6 p.m.	0 9	,,	0 3	,,	9 2	12 p.m.	2 0	,,	5 1
8	10 p.m.	3 3	12 p.m.	0 7	,,	0 3	,,	6 6	10 a.m.	2 4	,,	3 6
9	1 a.m.	3 0	,,	1 0	7 p.m.	0 10	12 p.m.	9 11	6 p.m.	2 0	12 p.m.	2 10
10	5 p.m.	1 7	1 a.m.	1 0	1 a.m.	0 9	9 a.m.	10 5	1 a.m.	1 10	5 p.m.	7 4
11	1 a.m.	1 3	,,	0 6	4 p.m.	0 7	1 a.m.	8 0	12 p.m.	1 4	1 a.m.	6 9
12	6 p.m.	1 6	4 p.m.	0 9	1 p.m.	0 5	,,	4 6	,,	1 3	,,	4 0
13	1 a.m.	1 6	8 p.m.	1 5	noon	0 3	12 p.m.	8 8	,,	4 3	,,	3 1
14	noon	0 8	6 p.m.	0 11	,,	0 2	6 a.m.	9 2	9 a.m.	6 0	12 p.m.	3 9
15	6 p.m.	0 9	3 p.m.	0 6	,,	0 2	1 a.m.	6 11	1 a.m.	3 8	9 a.m.	4 2
16	12 p.m.	0 11	6 p.m.	0 6	,,	0 4	,,	3 3	,,	2 0	12 p.m.	7 2
17	,,	2 2	12 p.m.	1 5	,,	0 4	5 p.m.	2 9	12 p.m.	1 7	2 a.m.	7 3
18	1 p.m.	2 0	2 a.m.	1 8	4 p.m.	0 7	1 a.m.	2 7	,,	1 9	1 a.m.	6 2
19	2 p.m.	1 1	12 p.m.	1 7	noon	1 6	3 a.m.	4 6	10 p.m.	5 1	,,	3 11
20	3 p.m.	0 10	,,	2 10	,,	1 0	,,	4 5	1 a.m.	4 9	,,	2 4
21	,,	0 8	2 a.m.	2 11	1 a.m.	0 9	1 a.m.	2 9	1 p.m.	3 1	,,	1 9
22	,,	0 7	1 a.m.	2 0	1 p.m.	0 7	,,	2 0	12 p.m.	2 1	,,	1 3
23	6 p.m.	0 7	,,	1 0	3 p.m.	0 6	3 p.m.	1 4	,,	4 7	12 p.m.	2 9
24	4 p.m.	0 7	,,	0 8	2 p.m.	0 7	noon	1 0	noon	6 10	11 a.m.	3 0
25	3 p.m.	0 6	12 p.m.	1 3	4 p.m.	0 11	,,	0 9	1 a.m.	4 10	1 a.m.	2 8
26	12 p.m.	1 1	1 p.m.	2 10	noon	0 7	3 p.m.	3 3	12 p.m.	6 11	,,	1 7
27	noon	1 9	1 a.m.	1 10	1 a.m.	0 6	1 a.m.	2 11	3 a.m.	7 1	9 p.m.	5 6
28	,,	0 11	6 p.m.	0 11	noon	0 3	,,	2 5	6 p.m.	4 10	1 a.m.	5 4
29	,,	1 0	1 a.m.	0 10	9 a.m.	0 4	,,	1 11	1 a.m.	4 6	,,	3 2
30	12 p.m.	2 3	,,	0 10	noon	0 3	noon	1 3	12 p.m.	4 11	11 a.m.	3 6
31	noon	2 11	12 p.m.	0 6			9 p.m.	1 6			1 a.m.	2 6

ADDITIONS TO THE MUSEUM

During 1938.

Anonymous.—Five £1 and five 10/- Treasury Notes.

Belt, T.—Roman fumed Urn, found during excavations at the "Victoria Vaults," Nunnery Lane, York, September, 1938.

Bootham School.—Anglo-Gallic Jetton, c. 1300, found in the earthwork on Holgate Hill, York, May, 1936, by boys of Bootham School.

Burton, G. M.—Two German Bank Notes (1,000 and 100,000 Marks), and Iron Cross.

Chadwick, John F.—Quill-pen maker in case, c. 1835-45.

Chidell, Claude.—3 Wax impressions of seals of St. Mary's Abbey, and 1 of the Merchant Adventurers' Company, York.

Cocker, Miss.—Mediaeval carved stones.

Collingbourne, A.—Three Horse-shoes found in old cobbled road, near Acomb, 1937.

Cooper, W. A.—Old Bullet Mould; Bow or Turning Saw; early "Lancashire" Screw Plate and Tap Wrench, and Taps; Old Padlock and Key.

Corder, Philip.—Two Spearheads found in the earthwork on Holgate Hill during excavations by boys of Bootham School under P. Corder, May, 1936.

Curran, Mrs.—Old Dutch Weather Glass.

Davis, The Misses.—Advertisement Counter of George Chapman, Hosier, 10 High Ousegate, York, and one of B. Grant & Sons, Jewellers, Barnsley.

Dodsworth, E. R.—Old Deed with interesting large seal of Victoria, 1867; Two Bank Notes, 1873 (£20 and £10) of Swaledale and Wensleydale Bank.

Foot, G.—Quill Pen Maker.

Geological Survey Office, York.—Collection of specimens from the Boulder Clay, Balby, near Doncaster.

Hardacre, J.—Commemorative Medal of the opening of the 1862 Exhibition.

HAWKSWELL, R. H. R.—Two bone implements used in the Hebden Linen Mill, Navigation Road, York.

HAWTHORNE, MRS. M. E.—Mediaeval Stone Mortar found during excavations in Peckitt Street, York; Two Spider Crabs.

HEARFIELD, MISS.—Six Old Playbills.

HIND, J.—Glass Walking Stick.

HODGKINSON, H. R.—Steel Key, c. 1710, found in York.

HUDLESTON, N. A.—Small collection of mediaeval Tobacco Pipes; carved head of a Ceremonial Staff from New Zealand; Ancient Egyptian Plumb Weight; Section of Roman Column from Castlegate, York; old Churchwarden Tobacco Pipe, found at Peaseholme Green, York; Glacial Pebble from Water Lane, Clifton; fragments of Roman Drain Pipe, found in Marygate, York; Danish bone Pin, found during excavations in Market Street, York; small bronze Ring from St. Martin's Lane, York; mediaeval roofing Tile from Scarborough; fragments of green-glazed Pottery from Coppergate, etc., York; stone Pounder from Lord Mayor's Walk Moat; fragments of mediaeval Tobacco Pipes; 2 mediaeval Drain Pipes; Danish Knife Handle; 2 Roman Knife Handles; Danish Loom Weight from Lower Priory Street, York; numerous carved stones, found in York.

KELLY, MRS.—Carved stone, found in St. Martin's Lane, York.

KENDRAY, W. E. (per N. A. Hudleston).—Roman Tile, $14\frac{3}{4}$ ins. by $14\frac{3}{4}$ ins., from floor of Roman Bath, found during excavations at the Mail Coach Inn, York.

KIRKUP, R. G.—Model of a Maori Canoe, made by the Maoris, c. 1840.

KROUS, MISS.—Stone Mortar, found on a rockery at 45, Bootham, York; Stones from St. Mary's Abbey, as follows:—Stone from Norman Entrance to Chapter House; Arch stone with Norman large cable moulding; fragment of E.E. enriched roll moulding (of same design as arch found at West end of Vestibule); piece of double-sided blind tracery; section of Decorated window tracery; two sections of square-headed window tracery; vault keystone boss (defaced); Finial, with leaf ornament; piece of large roll mould; two parts of large cresset stone; three other small stones; all from the garden of 45 Bootham.

LEECH, H. T.—Specimen of quartz with iron pyrites.

Limoges, France.—Syndicat D'initiatives Du Limousin.—Limoges Plate used at the State Luncheon held in honour of Their Majesties King George VI and Queen Elizabeth, on July 21st, 1938.

McFadyen, Mrs. A. E.—Roman Horse-shoe, from West Witton, Yorks.

Ogden, J. R.—Oak Box, inscribed "Made from the Ruins of York Minster. Burnt 2nd Feby., 1829."

Ottley, The Misses Alice and Catherine.—Heraldic marble-topped Table, given in remembrance of Lt.-Col. G. F. Ottley, D.S.O.

Pallister, A.—MS. on the Loss of the Harpooner, 1816.

Pawson, Miss.—Eighteenth century Halfpenny Token of York, 1796, probably struck by Cattle, Barber & Cattle.

Penty, F. T.—William III Crown Piece and 8 sundry Coins.

Poulter, W.—£1 Note, Leeds Bank, 1809.

Pritchard, H.—Stoneware Wine Barrel, inscribed "John Bacon, Spirit Merchant, York" (c. 1843); Brose Skip.

Proctor, Wilfrid.—Two forged £5 Notes of York Bank, 1854; £5 Note of York Bank, 1855; Four £5 Notes of Scarborough Bank, 1879.

Rafton, W.—Old Brass Clock Key, c. 1825; Globe Watch.

Scarr, S.—Fragment of Roman Urn, fumed ware, found in the clay of Earswick brickyard.

Scott, F. O.—4 Roman Coins, 1 Greek Coin, 1 English Coin, 1 Irish Coin, 1 English Token, 2 English Medals.

Smith, Sydney, H.—White Metal Toilet Set and Bracelet (probably late Saxon, and from a burial), found in Burton Fields Gravel Pit, Stamford Bridge.

Stephenson, Bernard.—Forgery of Dollar of Charles III of Spain, 1794, countermarked in 1797 with the Plate Duty oval stamp of George III of England.

Thomson, Lady.—Early Victorian Lady's Card Case; Medal of Princess Charlotte.

Thorpe, Miss.—Six Wooden Confectioner's Moulds.

Ware, Col. Innes N.—Unissued £5 Note, Thirsk Bank (about 1830-35); Three Share Certificates, 1840.

Whytehead, The Rev. R. Y.—Old Map of Campsall; two folios of Author's Prose and Poetry MSS.

WITTY, EDWARD.—Bronze Prize Medal, Yorkshire Fine Art and Industrial Exhibition, York, 1866.

WRIGHT, MRS. E.—Beaded Purse, two pairs Snuffers, Ash Tray, Metal Match Box, Letter Scale and MS.

COOPER, W. A.—Letter Weights turned from lead found in the walls of St. Mary's Abbey.

DONATIONS TO GARDENS.

COOCH, P.—Seeds of various herbaceous plants.

COOPER, MISS DORA V.—Collection of rockery and other plants.

TERRY, SIR FRANCIS.—Ten Oak Garden Tubs.

ON LOAN.

HURST, A.—Punch Ladle, inscribed "City of York, 1720."

PHILLIPS, DR. H. A.—Antique silver plated Candlestick.

ADDITIONS TO THE LIBRARY.

During 1938.

Arkell, W. J.—"The British Corallian Lamellibranchia," part x (by W. J. Arkell, M.A., D.Sc., F.G.S.).

Auckland, N.Z.—Annual Report of the Auckland Institute and Museum, 1937-38; Records, vol. 2, no. 2; Auckland War Memorial Museum.—Handbook of Maori and Oceanic Ethnology (By Gilbert Archey); Fossil Pollens (By Lucy M. Cranwell); Post-Pleistocene Pollen Diagrams from the Southern Hemisphere—i) New Zealand. (By Lucy M. Cranwell and Lennart von Post.)

Australian Museum.—Annual Report, 1936-37.

Australian and New Zealand Association for the Advancement of Science.—Report of the Twenty-third Meeting (Auckland, 1937).

Belfast Natural History and Philosophical Society.—Proceedings and Reports, Second Series, vol. i, part 2.

Blanshard, T.—"The Observator, in Dialogue" (2nd vol.) (1687).

Boston, Mass., U.S.A.—"Old-time New England" (The Bulletin of the Society for the Preservation of New England Antiquities), vol. xxviii, nos. 3, 4; xxix, nos. 1, 2.

Brighton and Hove Natural History and Philosophical Society.—Annual Report for year ending June 30th, 1937.

Brooklyn, N.Y.—Brooklyn Botanic Garden Record.—Vol. xxvii, nos. 1-4.

Burdekin, J. L.—Burdekin's Old Moore's Almanack for 1939.

Cahill, R. S.—Journal of the Chemical Society, Jan.-Dec., 1938.

California, State of.—Bulletin of the Department of Agriculture.—Vol. xxvi, no. 4; xxvii, nos. 1,4.

——— university of.—Bulletin of the Department of Geological Sciences, vol. 24, nos. 8-11.

Canada, Department of Mines.—Annual Report of National Museum of Canada for 1936-37; Bureau of Geology and Topography.—Geological Survey, Memoirs nos. 207, 211, 215, 218; Bureau of Economic Geology, Memoir no. 199.

Cardiff, National Museum of Wales.—Thirtieth and Thirty-first Annual Reports (1936-37, 1937-38).

Carnegie United Kingdom Trust.—Twenty-fourth Annual Report (1937); "A Report on the Museums and Art Galleries of the British Isles" (By S. F. Markham, M.P.); "Museums and the Public."

Clark, Miss Mary Kitson, M.A., F.S.A. (Author).—"The Yorkshire Food-Vessel" (Reprinted from the Archaeological Journal, vol. xciv (1938).

Colchester and Essex Museum.—Report for the two years ending March 31st, 1937.

Drummond, O.—"York, 1906" (British Association Handbook) (Ed. by G. A. Auden, M.A., M.D. (Cantab.); "Choice British Ferns" (By C. T. Druery, F.L.S.) (1888).

Dublin, National Museum of Ireland.—"A List of Irish Birds, showing the species contained in the National Collection" (By G. R. Humphreys) (1937); Report 1935-36.

Edinburgh, Royal Scottish Museum.—Report for 1937.

——— Royal Society of.—Proceedings, vol. lvii, part iv; lviii, parts i, ii; lix, part ii.

Glasgow Naturalist.—Vol. xii, part ii (1936); xiii, part i (1937).

Grantham Public Library and Museum.—Tenth Annual Report, 1931-32; Thirteenth Annual Report, 1934-35; Sixteenth Annual Report, 1937-38.

Hull Museum.—Publications, nos. 195, 196.

Illinois State Geological Survey.—Bulletin no. 64; Report of Investigations, nos. 43, 44, 46; Subsurface Contour Map of the Illinois Basin.

India (Calcutta).—Geological Survey of India.—Records, vol. lxxi, part 4; lxxii, part 2; lxxiii, parts 1, 3; Memoirs, vol. lxxii, part 1.

Japan, National Research Council of.—Japanese Journal of Zoology.—Vol. vii, nos. 3, 4; viii, no. 1.

Leeds Philosophical and Literary Society.—Proceedings, Literary and Historical Section, vol. iv, parts 5, 6; Scientific Section, vol. iii, parts 7, 8.

——— University of.—Thirty-third Report, 1936-37; Publications and Abstracts of Theses by Members of the University during Session 1936-37.

Leicester Literary and Philosophical Society.—Transactions, vol. xxxix (1937-38).

Leicester Museum, Art Gallery and Library Bulletin.—Quarterly, nos. 55-58; 34th Report (Museum and Art Gallery), 1st April, 1937—31st March, 1938.

London, British Association for the Advancement of Science.—Report of Annual Meeting, 1937 (Nottingham).

——— British Museum.—Catalogue of Imperial Byzantine Coins in the British Museum (By Warwick Wroth), vols. i and ii; Catalogue of the Coins of the Vandals, Ostrogoths and Lombards, and of the Empires of Thessalonica, Nicaea and Trebizond, in the British Museum (By Warwick Wroth); List of Catalogues, Guide Books and other Publications, published by the Trustees of the British Museum.

——— British Museum (Natural History).—Summary Guide to the Exhibition Galleries, Brit. Mus. Nat. Hist. (5th ed.); Mosquitoes of the Ethiopian Region—ii—Anophelin (Adults and early stages); Instructions for Collectors (Brit. Mus. Nat. Hist.), no. 2—Birds and their Eggs; no. 13—Alcohol and Alcoholometers.

——— Geological Society of.—Quarterly Journal, vol. xciii, part 4; xciv, parts 1-3.

——— Meteorological Office.—Monthly Weather Reports, Supplements, etc.

——— University of.—Institute of Archaeology.—First Annual Report (1937).

——— Victoria and Albert Museum.—Annual Review, 1936, 1937.

——— Zoological Society of.—Proceedings, Series A, vol. 107, part iv; 108, parts i-iii; Series B, vol. 107, part iv; 108, parts i-iii; Series C, vol. 107, no. 13; 108, nos. 4, 8-12; Transactions, vol. xxiii, parts 5, 6; xxiv, part 2.

Macdonald of the Isles, Sir Godfrey M., Bart.—"Account of St. Mary's Abbey, York" (By the Rev. C. Wellbeloved) (1829).

Madison, Wisconsin, U.S.A.—Wisconsin Academy of Sciences, Arts and Letters.—Transactions, vol. xxx.

Manchester Geographical Society.—Journal, vol. xlviii (1937-38).

——— John Rylands Library.—Bulletin, vol. 22, nos. 1, 2.

——— Literary and Philosophical Society.—Memoirs and Proceedings, vol. 81 (1 part); 82 (9 parts).

——— Museum Publications.—Nos. 113-115.

Millport, Buteshire, Marine Biological Station.—"On the growth and feeding of the larval and post-larval stages of the Clyde herring" (By S. M. Marshall, A. G. Nicholls, and A. P. Orr).

Montevideo, Anales Del Museo De Historia Natural De Montevideo.—2a Serie, Tomo iv, num. 12.

New York Academy of Sciences.—Annals, vol. xxxvii, Articles 2-5.

Newton, The Misses G. L. and M. D. (per the Harrogate Group of the Yorkshire Archaeological Society).—"Cicero's Life and Letters" (By Dr. Middleton, Wm. Melmoth and Dr. Heberden) (1880); "History of the Roman Emperors" (By the late Rev. Robert Lynam, M.A.), vols. i and ii (1850).

Northampton, County Borough of.—Annual Report of Public Libraries, Museums and Art Gallery, 1936-7.

Northamptonshire Natural History Society and Field Club.—Journal, vol. xxviii, nos. 217, 281.

Norway.—Oslo Meteorological Institute.—Radiovaer 1938.

Nova Scotian Institute of Science.—Proceedings, vol. xix, part 3 (1936-37).

Ogden, J. R.—"Reliquiae Eboracenses" (H. D. Ripensem) (1743).

Oxford, University Museum.—49th Annual Report (1937).

Perthshire Society of Natural Science.—Transactions and Proceedings, vol. ix, part vii (1937-38).

Russia.—Academy of Sciences of the Ukrainian S.S.R.—Publications, nos. 4-7 (1937), 1-6 (1938).

Salford Art Gallery, Museum and Libraries.—Report for 1937-38.

Salisbury, Rhodesia.—The Queen Victoria Memorial.—Annual Report for year ended 31st March, 1938.

Southport, County Borough of.—The Fernley Observatory.—Report for 1937.

Swedenborg Society (inc.).—Transactions, nos. 3, 4.

Thompson, Geoffrey.—"The Warning Voice of a Hermit Abroad" (By Richard Milnes) (1825); "The Medals of the Northumbrian Bag-pipes." (By Gilbert Askew).

TORONTO, UNIVERSITY OF.—Studies, Biological Series, nos. 43, 44.

TORQUAY NATURAL HISTORY SOCIETY.—Transactions and Proceedings, Vol. vii, part iii and Supplement; part iv.

TUFTS COLLEGE STUDIES.—Vol. vi, nos. 1, 2.

WASHINGTON, U.S.A.—JOURNAL OF AGRICULTURAL RESEARCH.—Vol. 55, nos. 9-12; 56, nos. 1-11; 57, nos. 1-4.

——— BUREAU OF AMERICAN ETHNOLOGY.—54th Annual Report (1936-37); Bulletin 117, 119.

——— SMITHSONIAN INSTITUTION.—Annual Report, 1937.

——— SMITHSONIAN INSTITUTION.—United States National Museum.—Report for 1937.

WELSHPOOL.—THE POWYSLAND MUSEUM, REFERENCE LIBRARY AND ART GALLERY.—Annual Report (1934-35).

WOLSTENHOLME, MISS E.—Two old Bibles (York, 1789 and Edinburgh, 1795), and an old Dictionary (by the Rev. James Barclay, Liverpool, 1816).

YORK, CITY OF.—Annual Reports of Medical Officer of Health, etc., for 1937.

——— Reports of the Art Gallery, Exhibition Hall and the Castle Museum, 1936-38.

YORKSHIRE AGRICULTURAL SOCIETY.—Journal, 1938.

——— FISHERY DISTRICT.—71st Annual Report (1937).

——— GEOLOGICAL SOCIETY.—Proceedings, vol. xxiii, part iv.

PUBLICATIONS AND PAPERS

CONTRIBUTED BY THE HON. CURATORS AND KEEPER, OR DEALING WITH MATERIAL CONTAINED IN OR ADDED TO THE COLLECTIONS.

ARKELL, W. J.—A Monograph of the Ammonites of the English Corallian Beds. Palaeontographical Society, London, 1937, Pt. iv, pp. 69-104, pls. xiv-xviii.

BROOKLYN BOTANIC GARDEN RECORD.—1938, xxvii, p. 254.

BULMER, WILLIAM.—Dragonesque Brooches and their Development. Antiquaries Journal, 1938, pp. 146-153, 4 figs.

CLARK, M. KITSON.—The Yorkshire Food-Vessel. Arch. Journ., 1938, xciv, pp. 43-65, pl. i and figs.

HAGEN, WILHELMINE.—Kaiserzeitliche Gagatarbeiten aus dem Rheinischen Germanien. Darmstadt, 1937.

MELMORE, SIDNEY.—Abraham Sharp's Universal Instrument. The Observatory, 1938, pp. 248-250.

NEWBIGIN, NANCY.—The Neolithic Pottery of Yorkshire.—Proc. Prehist. Soc., 1937, pp. 189-216, pls. xiv-xvii, 7 figs. and map.

PRESSLY, I. P.—A York Miscellany compiled from Records of the past four centuries. London: 1938. A. Brown & Sons, Ltd.

WARD, GORDON.—Horse Shoes at Lewes Museum. Sussex Notes and Queries, 1938, pp. 6.

WRIGHT, JAMES.—Some British *Platycrinidae* and Descriptions of New Species. Geol. Mag., 1938, lxxv, pp. 266-287, pls. viii-xi.

PROCEEDINGS

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YORKSHIRE

PHILOSOPHICAL SOCIETY.

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PROCEEDINGS
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1938.

THE OCCURRENCE AND ORIGIN OF CHERT IN THE CORALLIAN FORMATION IN YORKSHIRE.

By Vernon Wilson, Ph.D., B.Sc., D.I.C., F.G.S.

CONTENTS.

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1. INTRODUCTION.

Silica occurs in a large number of igneous and sedimentary rock types in one or more of its many mineralogical forms. Perhaps the most common and, nowadays, least valuable form of silica is chert or flint, but in past times two or three flint implements were the most precious possessions of pre-historic man.

The distinction between chert and flint in England is usually made on a colour basis ; the former varies from white to grey while the latter is usually much darker, being almost black. From the point of view of the occurrence of these minerals in the British deposits, it would be convenient to restrict the term "flint" to cover only the occurrence of chert in the Chalk.

Chert enjoys a wide distribution throughout the geological column, though it is principally found as an original constituent—when not constituting a stage in a mineralisation process of subsequent date—in fine grained calcareous and arenaceous sediments which are invariably of shallow water origin.

Notably, large quantities of chert occur in Britain in the Durness Limestone Series in the N.W. Highlands; in the L. Carboniferous Limestones in Flintshire, Derbyshire and Yorkshire; locally, in the Portlandian rocks in Dorset; and large quantities in the Chalk. The classic sections in the Upper Corallian Limestones at North Grimston in the Eastern Howardian Hills have been studied by generations of geologists and the abundance of nodular chert in association with certain beds noted in passing. During recent years of study on these rocks in Yorkshire, other localities and horizons at which chert occurs have been recorded, and in the present work these instances are described and their probable origin is discussed.

2. FORM AND MODE OF OCCURRENCE.

Modern workers on chert problems are tending to confuse the issues by endeavouring to recognise and define various forms or types of chert occurring in sedimentary rocks, afterwards proceeding to invoke modifications of one or more of the existing theories to account for the origin of their types. For example, Jessop (5) has defined three types of Carboniferous chert from Derbyshire, while Sargent (10 and 11) has recognised two types of chert of the same age in Flintshire.

From recent observations on the occurrence of chert in the Durness Limestone Series in the N.W. Highlands; the Lower Carboniferous Limestones of Derbyshire and Yorkshire the Corallian formation in Yorkshire, and the Yorkshire Chalk, the writer is convinced that a general twofold classification will satisfy all such occurrences. This suggested classification is as follows :—

1. Core Chert—including all occurrences of chert found within a bed of rock in which the contact of the chert and enclosing sediment is gradational.
2. Nodular Chert—includes all forms of sharply defined nodules, lenticles and longer ramifying masses of chert, all having distinct and abrupt junctions with the associated sediment. Nodular chert may occur anywhere within a bed or along bedding planes.

Core Chert occurs in the Lower Calcareous Grit and in the impure oolitic beds of the overlying Hambleton Oolite Series. It is grey in colour and occurs as ill-defined masses and bands within individual beds of rock; it usually occupies the central part of the bed, but may also occur in any other position within the bed, and is invariably parallel to the

general bedding. Such concentrations of chert vary in size, thickness and shape, and do not appear to affect any structures developed in the surrounding rock. In all cases there is a gradual transition between the chert and the enclosing sediment.

The Nodular Chert is darker than the preceding type and occurs in the Hambleton and Osmington Oolite Series as lenticles and nodules of varying sizes distributed sporadically throughout the beds of rock or occurring in lines at different levels parallel to the bedding. Occasionally it is found as definite continuous bands or bands of semi-confluent nodules, always sharply defined from the associated sediments.

The large nodules are usually very irregular in shape and possess numerous nodes, mainly on their upper surfaces, which frequently extend upwards into the overlying limestone and may become fused with a large nodule or band at a higher level. These conditions are common at North Grimston where much nodular chert occurs in the upper beds of the Osmington Oolite Series ; in three instances upward extensions of nodes have taken place along vertical lines which are now joints and fused with other nodules at higher levels. This occurrence in the joints has led other workers to regard the whole of the chert as of secondary origin, but in subsequent pages the writer will endeavour to show how this joint chert may be contemporaneous in origin with the remainder of the chert. Further, whereas the nodular chert is tenacious and breaks with a definite conchoidal fracture, that occurring in the joints has a splintery fracture and is almost crumbly in character.

3. RANGE, DISTRIBUTION AND FIELD RELATIONS TO THE ENCLOSING SEDIMENTS.

The Corallian succession in Yorkshire is briefly given as follows :—

5. Upper Calcareous Grit.
4. Osmington Oolite Series.
3. Middle Calcareous Grit.
2. Hambleton Oolite Series.
1. Lower Calcareous Grit.

With the exception of the Middle and Upper Calcareous Grits, chert occurs in the remaining three divisions of the Corallian sequence, and these occurrences are restricted to the western parts of the Tabular Hills, the Hambleton and Howardian Hills regions. It will be convenient to consider the chert in the Lower Calcareous Grit separately from its occurrence in the oolitic limestone divisions.

(b) Chert in the Lower Calcareous Grit.

A great deal of the Lower Calcareous Grit in the western parts of the Tabular and Howardian Hills, and in the Hambleton Hills is intensely hard and highly siliceous, and in many localities it contains large quantities of grey chert. The siliceous character of this rock is largely due to the presence of large numbers of the spicules of the sponge *Rhaxella perforata*, Hinde, and though the remains of this organism may have contributed much of the silica of the chert, it is not considered that they constituted the entire source of this material. The chert found in these rocks is of the "Core" type ; sections of strata in which this type of chert occurs are found in the escarpments, natural valley exposures and quarries in the areas lying to the west of Kirby Moorside and north of Helmsley ; throughout the Hambleton Hills, and in the Castle Howard, Hovingham, Gilling and Coxwold districts of the western Howardian Hills.

Some 58 feet of the Lower Calcareous Grit are seen at the roadside leading from Rievaulx over Ashberry Hill, in Ryedale ; the beds vary in thickness from 1 foot in the upper part to 3 feet towards the base. The rock is a fine grained, buff coloured gritstone and many of the beds have central cores of grey chert. These chert cores vary in thickness, usually measuring from a quarter to a third of the thicknesses of the enclosing beds. The chert is of a medium grey colour and merges gradually, upwards and downwards, into the enclosing gritstone. No nodular development is present and the chert cores show no thickening or thinning in any direction. Occasionally a rock bed has no continuous chert core, but contains sporadic patches of grey chert of varying sizes.

Similar hard gritstones are quarried at Newgate Bank, 6 miles N.W. of Helmsley, where the beds are more massive and the ever present core chert is more fully developed than at the previous locality, frequently constituting as much as 9/10ths of a particular bed.

On the western side of Ryedale the Grit is exposed in Murton Bank near Hawnby, where again the gritstone beds have the grey chert developed within them ; generally, these rocks are extremely hard and, on this account, are in demand for road material where they can be conveniently worked close to a road.

Another example may be cited on the south side of the Hambleton Hills where, in a small quarry by the steep road leading from Beacon House on Ampleforth Moor down to Ampleforth, the Lower Calcareous Grit is again seen containing

this grey core chert. In all these localities the Lower Calareous Grit is well bedded and well jointed and the clean rectangular jointing has affected the chert bands to no less extent than the associated gritstone.

Further examples of these chert-bearing gritstones are forthcoming from localities in the western Howardian Hills. They occur in quarries in Newburgh Park, Coxwold; in Gilling Park; Potticars Quarry in Hovingham Banks Wood; and in the famous Park Quarry at Castle Howard. In most of the sections which have been studied the chert tends to occupy an approximate central position within any individual bed, but it may also be developed nearer the upper or lower bedding planes.

In the western areas of the Howardian and Tabular Hills and in the Hambleton Hills the Lower Calcareous Grit possesses the highly siliceous characters referred to above. These features are due to the rock being largely composed of the siliceous spicules of *Rhaxella perforata*, Hinde, and the chert present in these rocks is composed entirely of these spicules.

(c) Chert in the Limestones.

1. The Hambleton Oolite.

The Hambleton Oolite succeeds comformably on the Lower Calcareous Grit and has its most typical development in the Hambleton Hills, where it amounts to about 90 feet of strata. In the lower beds it contrains considerable quantities of chert, much of which is of the "core" type so prevalent in the underlying gritstones, but nodular chert is also common, particularly where the rock tends to be more thinly bedded. The most northerly exposure occurs at Whitestone Scar on the south side of Black Hambleton; here, the lower beds of the oolite are impure and somewhat gritty in character and the chert present occurs as disconnected patches within individual beds (see fig. 1).

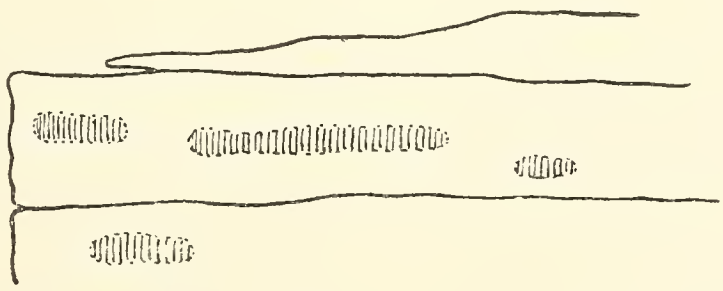

Fig. I. Core Chert (shaded) seen in a small outcrop of Hambleton Oolite on Whitestone Scar in the Hambleton Hills.

Occasionally, more sharply defined bands of chert are developed in these beds but the irregular masses are more common ; they vary in size and are not sharply defined from the surrounding limestone. Generally, the limestone is a hard gritty oolite, evenly and thickly bedded, well jointed and containing much comminuted shelly material and large numbers of siliceous *Rhaxella* spicules. Some of these characters are common in the chert ; large number of ooliths and misshapen granules, shell fragments and *Rhaxella* spicules abound, though the latter occur in greater numbers than in the surrounding rock. In no case does the chert exhibit any characters which would suggest its origin being due to the subsequent replacement of the limestone. This oolitic limestone has been used in the construction of the walls around the fields and moors of the Hambleton Hills, and judging from the quantities of chert present in these walls, it is evidently widely distributed through the rocks in this region.

To the east of Ryedale the lower beds of this division are seen in numerous quarries to the north of the villages of Carlton and Pockley, where chert occurs as sporadic, irregular masses in the oolite. In some of the less thickly bedded higher beds, however, much of it is definitely nodular in character, the nodules being sharply defined from the surrounding oolite. The nodules have a general lenticular form and may occur at any level within a bed, either singly or in discontinuous lines, and in all cases the longer axis of the nodule is parallel to the bedding planes. They contain ooliths, occasional shell fragments and siliceous *Rhaxella* spicules, though the latter are less abundant than in the previously described cherts.

2. The Osmington Oolite.

Nodular chert only is found in the Osmington Oolite Series and its occurrence in this division is confined to the upper beds. In a small quarry close by the York Road at Helmsley, the horizon of the Coral Rag is represented by 15 feet of thickly bedded fine grained calcareous mudstones, in which roughly rounded nodules of homogeneous dark blue chert are present. The nodules vary in size from 1 to 8 inches and are widely separated within the thick beds. The chert is sharply defined from the enclosing mudstone and with the exception of a certain amount of limonitic staining it is free from any impurities.

Four and a half miles to the south east of Helmsley, lenticular nodules of chert occur in the upper Osmington

Oolites at Nunnington, where they are found in a 4 feet bed of oolite and are from 2 to 3 inches in thickness. The chert has a pale greyish blue colour and contains lighter coloured siliceous ooliths scattered throughout. Similar nodules occur in oolitic limestones of the same age at East Ness, 1½ miles east of Nunnington ; here, however, the chert groundmass is darker blue in colour.

In the Howardian Hills, chert of this age is present at two localities, namely, Slingsby and North Grimston. In the large quarry section at the former village the individual nodules of dense blue chert are distributed in lines in the beds of oolite immediately below the Coral Rag (Fig. II).

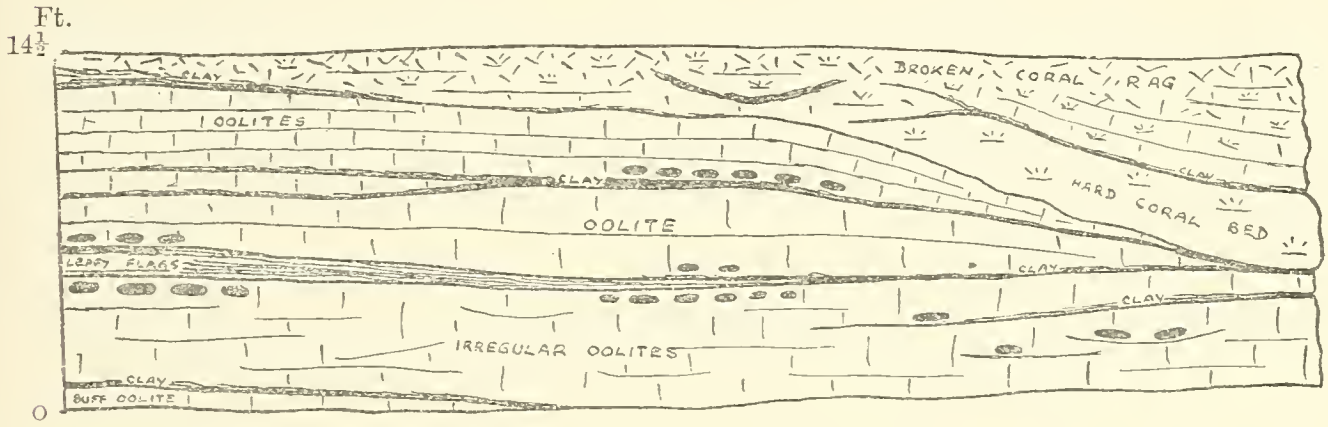

Fig. II. Large quarry section in Osmington Oolites at Slingsby. Chert nodules are shaded in black.

Large quantities of nodular chert occur in the lower part of the Osmington Oolite Coral Rag in the North Grimston district at the eastern extremity of the Howardian Hills. The writer has already (15, pp. 500-1) referred to the presence of this chert in exposures near Grimston Field House, and on North Grimston Hill.

The chert occurs as large sporadic nodules, chains of nodules or as thick nodular bands, bifurcating and ramifying through the thick limestones. The limestone is well jointed, the joints being up to 6 inches in width and some of them are partly filled with splintery chert (Fig. III).

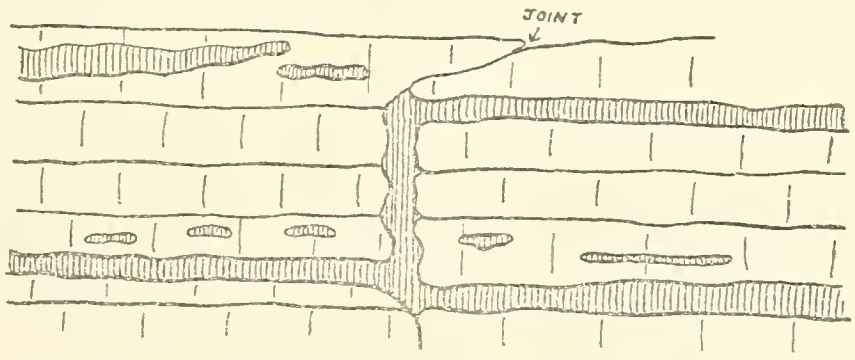

Fig. III. An example of Nodular Chert (shaded) in the Osmington Oolite Coral Rag at North Grimston.

which is usually connected with two or more of the levels at which nodules occur.

4. MEGASCOPIC AND MICROSCOPIC CHARACTERS OF THE CHERTS.

The Lower Calcareous Grit Chert is of a uniform medium grey or bluish grey colour, dense and having a dull vitreous lustre and a splintery fracture. Under the action of weathering and when fractured by the hammer it breaks into roughly rectangular fragments of different sizes or into sharp splinters. Any form of banding is entirely absent from this chert and it is also free from cavities. Close examination of some examples by the naked eye or with the hand lens reveals the presence of *Rhaxella* spicules as tiny round bodies rather lighter in colour than the chert matrix. This slight colour difference, however, disappears in thin sections. Excepting the presence of *Rhaxella* spicules no recognisable fossils have been recorded from it. Most of the thin sections show the presence of large numbers of these spicules, which belong to Types* B1, B2, B7, B8 and B10.

The groundmass consists of a mosaic of uniform micro-crystalline chalcedony, which in ordinary light presents a light buff colour due to limonitic staining. Small angular grains of quartz are common, along with an occasional fragment of calcite ; stray shell fragments and foraminifera have also been recorded, but they are rare. An interesting thin section of this chert from Newgate Bank shows a narrow vein of crystalline quartz traversing the section (Plate I, Fig. 6).

Generally, the chert from the limestones is dark bluish-grey in colour and frequently almost black. On this colour difference it is readily distinguishable from the Lower Calcareous Grit Chert. In addition it usually contains abundant ooliths and misshapen granules. Its lustre is dull and vitreous, and in the nodular form it breaks with a conchoidal fracture. Much of the chert in the lower beds of the Hambleton Oolite shows little difference from that of the Lower Calcareous Grit ; siliceous spicules of Types B1, B2, B4, B7, B8 and B11 are common in it. Large numbers of these spicules are stained by limonite and many of them are fused together into small buff coloured areas which appear as masses of brushes of fibrous chalcedony in polarised light. Invariably the groundmass of chalcedony is micro-crystalline, but fine brushes of fibrous chalcedony are frequently developed (Plate 1, Fig. 5).

* These types have been recognised and described by the writer (see 15, page 485).

The ooliths and misshapen granules are composed of fine grained cryptocrystalline chalcedony around a nucleus, which may be a calcareous or siliceous spicule, or a fragment of shell or calcite. Other impurities present in small amounts in the Hambleton Oolite chert are small grains of quartz and calcite, shell fragments and small doubtful starfish plates.

The nodular chert from the Osmington Oolite localities is usually dark blue in colour and in other megascopic characters it is similar to the Hambleton Oolite chert. The chert from the Coral Rag in the York Road quarry at Helmsley is the best example from these rocks of uniformly fine grained chalcedony containing no impurities. The chert of this age at Nunnington also consists of fine grained chalcedony, but the siliceous ooliths present show limonitic staining in concentric zones. Again, the ooliths in similar chert at East Ness have a more pronounced zoning which appears to be due to an uneven distribution of minute grains of haematite. In all cases the groundmass is predominantly fine grained chalcedony, but fibrous brushes of chalcedony are not uncommon.

In some of the lenticular nodules in the section at Slingsby, clearly defined ooliths and large granules are absent; such nodules appearing, in the hand specimen, as homogeneous, dense blue chert. When microscopically examined in ordinary light this chert appears to be made up of small granules of minutely crystalline chalcedony, showing degrees of density in their grey colour, in a matrix of fine grained chalcedony (Plate 1, Figs. 1 and 2). These small granular bodies are not sharply defined, and in polarised light the chert presents a more homogeneous microcrystalline appearance. The reason for this peculiar structure is diffficult to understand: the suggestion is made that it is due to the disintegration, through some agency, of the original silica gel followed by an almost immediate reconstitution and refusion of the fragments. Alternatively, the structure may have resulted from some peculiar mode of crystallisation.

Other nodules found at Slingsby contain malformed siliceous ooliths of extremely fine grained chalcedony set in a matrix which is also predominally fine grained chalcedony, but large, well defined areas are composed of fibrous brushes of chalcedony. These areas of brushes occur where the silica is most clear and free from any colouring or impurities, either in the ooliths, granules, or in the interstitial matrix. Most of the ooliths are stained by limonite and frequently contain

unevenly disseminated particles of clay. Fragments of angular and rounded quartz, shell fragments, small crinoid ossicles and occasional foraminifera are frequent impurities in all these nodules.

The chert nodules at North Grimston are devoid of ooliths, but they contain fragments of shells and algal tissue in fair abundance and occasional siliceous *Rhaxella* spicules of Types B1 and B2. The chert is mostly microcrystalline chalcedony though occasional fibrous brushes are developed. Oval or rounded areas also occur, having imperfectly defined outlines and any particular example may possess an irregular light brown central area surrounded by an outer clear zone. In polarised light they appear as areas of fibrous chalcedony frequently exhibiting a radial arrangement of the fibres. They may represent *Rhaxella* spicules which have undergone some form of corrosion.

5. NOTES ON THE RÔLE OF *RHAXELLA PERFORATA*, HINDE.

Mention has been made of the hard siliceous character of the Lower Calcareous Grit in the western parts of the Howardian and Tabular Hills and throughout the Hambleton Hills. In this province the Grit is pale buff in colour, thickly bedded, porous and full of tiny cavities left after the removal of the spicules of *Rhaxella perforata* which largely constitute this rock. The seas in this part of the Yorkshire basin must have been highly charged with silica in order to support the rich sponge life which existed; further, the sedimentary environment was not too rough or turbulent for the existence of these sponges, whose remains must, literally, have been rained down to the sea floor. The accumulating material during this period consisted of spicules and fine arenaceous sediment; but at intervals the accumulation of spicules predominated for a short time, resulting, later on, in the formation of the grey chert bands so common in many of the gritstone beds. Further discussion on the formation of this chert is given in the succeeding chapter.

This environment, so suited to these sponges, persisted into the early stages of the succeeding Hambleton Oolite period and we find the lowest beds of this calcareous series are arenaceous and contain spicules and spicule-bearing chert. With the increasing amount of calcareous sedimentation the *Rhaxella* sponges disappear and become rare in later episodes.

6. ORIGIN OF THE CHERTS.

(a) Review of previous research on cherts and discussion on the main theories of origin.

The earliest theory put forward for the origin of chert and flint has become known as the "Organic Theory," in which all chert and flint was considered to have been derived from the re-solution of siliceous organisms present in the rock. These organisms were usually siliceous sponge spicules, radiolaria and diatoms. This theory originated in England and was strongly advocated by Hinde, who based his views on his extensive studies of Carboniferous and Cretaceous cherts and flints in the British Isles (3 and 4). Unfortunately for the continued acceptance of this theory the chert-bearing rocks have never contained anything approaching an adequate profusion of siliceous organic remains available for re-solution and re-precipitation as chert, even if such processes could operate in these finely constituted sediments in their solid condition.

The idea of the re-solution of organisms and the subsequent re-precipitation of the dissolved silica as chert led to the "Replacement Theory." Briefly, this theory accounts for the formation of chert as a replacement product of the rocks in which it occurs. The replacement having been effected by the movement, upwards and downwards, of silica-bearing solutions along the joints and bedding planes, accompanied by percolation into, and the replacement of, the surrounding rock. This theory, however, fails to account for the formation of the great thicknesses of chert found in some geological formations, neither does it explain the chert centres in nodules or in beds of limestone and fine gritstone. It is difficult to conceive of any method by which the internal part of a bed or nodule could be replaced by silica-bearing solutions ; the consolidated rock would be impervious in most cases to the passage of solutions carrying colloidal or flocculated silica.

Tarr (12 and 13) and Twenhofel (14) have admirably summarised the arguments against these theories and no further discussion on them is necessary here. If this replacement action has occurred in chert-bearing rocks of all ages it should be proceeding at the present time, but unfortunately the phenomenon has so far never been encountered and doubtless never operated.

In recent years, cherts and flints have been closely studied by Professor W. A. Tarr (12 and 13) and others (6 and 14) in America, and by the late Mr. H. C. Sargent (9, 10 and 11) in England. As a result of this work the concensus of opinion favours an inorganic origin for these substances, in which the silica is believed to have been precipitated directly in the sea. Briefly, the "Syngenetic Theory" put forward by Professor Tarr (12) is as follows :—

". . . . .the silica contributed to the sea accumulates (the accumulation is made possible by the stabilisation of the colloidal silica particles) until its concentration causes it to be precipitated as a gel, the particles of which on settling to the bottom are aggregated into globular and ellipsoidal masses following the ordinary tendency of gels to assume globular forms that eventually become nodules and lenses of chert or flint. If the quantity of silica is large enough and the rate of precipitation sufficiently rapid, a continuous layer or bed would be deposited. Successive periods of accumulation, concentration, and precipitation at varying intervals would give rise to successive layers of nodules, lenses or beds."

Obviously this theory involves many questions which can only be answered by the physical and colloid chemist ; otherwise, it is more probably correct, from the geological point of view, than any of the previous theories. Unfortunately, the processes outlined in the theory cannot be observed at the present day, if they exist.

(b) Application of the Syngenetic Theory to the present problem.

The Corallian Series is largely calcareous. The so-called Grits were originally deposited as calcareous gritstones ; the arenaceous material in them is very fine grained and there is no doubt that originally a greater percentage of calcareous material was present, but much of it has been subsequently removed and replaced by limonite. Hence, it is reasonable to suppose that during this period the surrounding land areas were, topographically, low ; consequently, the surface run-off was small and denudation was largely of a chemical character. The seas must have been sufficiently rich in silica to support the rich sponge life which existed during the Lower Calcareous Grit period.

The waters entering the seas carried fine grained arenaceous material, calcareous muds, colloidal silica and, probably,

finely divided organic material. The latter, if present in sufficient quantities, would assist the sea electrolytes in precipitating the muds and in flocculating the colloidal silica (1). According to Tarr the precipitated silica would aggregate and form masses of gel which would sink to the sea floor and there become buried by the accumulating sediment. Subsequent dehydration and hardening of the gel masses would give rise to the chert. This explanation may be highly probable in accounting for the origin of nodular chert, but in the writer's view it does not appear to satisfy entirely the problem of the core chert, for which the following alternative explanation is advanced.

(c) Origin by Differentiation.

Once the precipitation of the colloidal silica is effected the flocculated particles would be carried down along with mud particles, $CaCO_3$ and other constituents of the deposit. In the unsorted, dilatant deposit so formed on the sea floor, movements of currents and of the constituents would be possible during the interval before final consolidation and cementation set in. During this precompaction interval it is suggested that some process of sedimentary differentiation took place, resulting in the aggregation of the flocculated particles of colloidal silica at various points or at some level within the mass of sediment. The movement was probably initiated by a preliminary small concentration of flocculated silica particles or a few siliceous spicules present at some point or points within the sediment. These preliminary concentrations would grow by adsorption of colloidal silica particles and also the movement of these constituents would be facilitated and expedited by forces of attraction and by currents rising in the deposit as its dilatancy is reduced and compaction advances. The gradual movement and migration of the siliceous constituents towards one zone or point would result in a corresponding displacement of calcareous and other particles. The completeness of this sedimentary differentiation will depend on the nature of the sediment, the grain size of the constituents, and the rate of deposition. Sediment of the nature of calcareous ooze and argillaceous mud bearing disseminated colloidal silica will continue to differentiate so long as the material surrounding the silica concentration zone remains sufficiently uncompacted to allow firstly, of the mechanical movement of flocculated silica particles to the concentration zone by forces of attraction and the agency of currents ; and secondly, after compaction

has proceeded beyond this point the concentrated zone of silica will continue to develop by adsorption of colloidal silica so long as the surrounding material behaves as a permeable membrane to the passage of the silica. Under these circumstances the subsequent chert, in a limestone for example, will be sharply defined from the surrounding sediment, for differentiation will cease relatively abruptly when the compaction of the sediment is completed and its cementation begun—a final process which may also be relatively rapid in shallow water calcareous deposits. In the case of fine grained arenaceous and impure oolitic calcareous deposits bearing disseminated flocculated silica particles, the process of differentiation would never be so fully completed ; it would be overtaken and stopped by the sediment having become compacted and cemented under the weight of superincumbent material. The silica particles would segregate into zones which would continue to grow by the agencies described above, but, by reason of the grain size of the sediment all the silica would not reach the concentration zone and thus, the later core chert would exhibit a gradation into the surrounding rock, which would still contain disseminated interstitial silica in varying amounts.

The end point of this process of differentiation comes with the final consolidation and cementation of the material. Concomitant with these final stages the segregations of colloidal silica gel are undergoing dehydration and recrystallisation to form chert.

Though the Syngenetic Theory may be a probable explanation of the formation of chert, the possibility of some process of differentiation, as given above, seems equally probable to account for the production of chert in rocks which were deposited in an environment where sedimentation was rather more rapid than the purely chemical precipitation of calcareous deposits, and where fine grained arenaceous and argillaceous materials were also contributing to the accumulating sediments.

In such an environment the existence of large masses of silica gel on the sea floor appears improbable ; the flocculated silica particles would be carried down along with the other sediment long before they were able to aggregate into globular masses of gel. It is only after the silica particles have been carried down with the sediment that differentiation commences and the silica begins to aggregate within the sediment.

Though the processes outlined above, in common with other theories of origin, cannot be seen in operation in the present seas, an almost analogous case is presented by the occurrence of silica in podzolised soils for, according to Neustruev (7)——". . . . .the chief difference between podzolised and chernozem soils consists in the form in which the precipitation of silicic acid occurs ; in podzolised soils the silicic acid accumulates in nests . . . . ." It is suggested that the formation of these "nests" of silica is brought about by agencies comparable, if not identical, with those which are suggested as being operative in the segregation of silica in sediments in the early stages of rock formation.

The process of differentiation described above will adequately account for the occurrence of the core chert in the Lower Calcareous Grit and basal impure beds of the Hambleton Oolite Series ; the process takes place to a finer degree in the production of the nodular chert in the finer limestones and mudstones of the Hambleton and Osmington Oolite Series. It remains only to account for certain instances of vertical nodular chert connecting two or more chert horizons, through the limestone beds or along joints, in the Osmington Oolite Coral Rag at North Grimston. These deposits are of very shallow water origin and it is suggested that the process of differentiation of the silica took place relatively quickly ; the consolidation and cementation of the limestones was probably effected before the complete dehydration and recrystallisation of the silica masses to form chert. Any incipient joint or line of weakness in the rocks would provide an avenue along which the plastic silica would be squeezed, eventually coming into contact with concentrations of silica at higher or lower levels.

7. SUMMARY.

The origin of the cherts in the Corallian rocks of Yorkshire is believed to have been contemporaneous with the accumulation of the sediments. The silica was of inorganic origin, being derived by the chemical denudation of the surrounding low-lying land areas, and was precipitated as colloidal particles by electrolytes in the sea and carried down with the accumulating sediments.

It is suggested that a process of differentiation in the uncompacted sediment resulted in the silica being concentrated at various points and along different levels within the mass of sediment. Later dehydration and recrystallisation converted the concentrated silica to chert. In advancing this

view the writer considers it to be a more probable explanation of the origin of the ill-defined chert masses and bands found within individual beds of rock, than is provided by invoking the Syngenetic Theory for the origin of all chert, though the latter theory is an equally probable explanation for the origin of the nodular chert.

In conclusion, I wish to thank Professor P. G. H. Boswell, F.R.S., for the facilities provided in the Department of Geology at the Imperial College of Science and Technology which have been at my disposal during the progress of this investigation.

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8. REFERENCES.

1. Boswell, P. G. H., 1930. "The Action of Colloids in Precipitating Fine-Grained Sediments." Geol. Mag., Vol. LXVII, pp. 371-381.
2. Hedges, E. S., 1931. "Colloids." London.
3. Hinde, G. J., 1885. "Sponges in the Lower and Upper Greensand of the south of England." Phil. Trans. Roy. Soc., Vol. 176, pt. ii, p. 403.
4. Hinde, G. J., 1887. "On the organic origin of the chert in the Carboniferous Limestone Series of Ireland and its similarity to that of corresponding strata of North Wales and Yorkshire." Geol. Mag., Vol. 24, pp. 435-446.
5. Jessop, P., 1931. "Agate, and the Cherts of Derbyshire, with a brief account of the history of the Lower Carboniferous Limestone of the Peak District of Derbyshire." Proc. Geol. Assoc., Vol. 42, pp. 29-43.
6. Moore, E. S., and Maynard, J. E., 1929. "Solution, Transportation and Precipitation of Iron and Silica." Econ. Geol., Vol. 24, pp. 272-303 ; 365-402 ; 506-527.
7. Neustruev, S. S., 1927. "Genesis of Soils." Russian Pedological Investigations III, Acad. Sciences U.S.S.R.
8. Ostwald, W. and Fischer, M. H., 1922. "Theoretical and Applied Colloid Chemistry." 2nd. Edition.
9. Sargent, H. C., 1921. "The Lower Carboniferous Chert Formations of Derbyshire." Geol. Mag., Vol. 58, pp. 265-278.
10. Sargent, H. C., 1923. "The Massive Chert Formation of North Flintshire." Geol. Mag., Vol. 60, pp. 168-183.
11. Sargent, H. C., 1929. "Further Studies on Chert. I." Geol. Mag., Vol. 66, pp. 399-411.
12. Tarr W. A., 1926. "The Origin of Chert and Flint." Univ. of Missouri Studies, Vol. I, No. 2, pp. 1-54.
    (This work contains a full list of references, many of which have been consulted).
13. Tarr, W. A., 1932. "Chert and Flint, Concretions, and Cone-in-Cone." Bull. Nat. Res. Council, No. 89, pp. 90-93.
14. Twenhofel, W. H., 1932. "Treatise on Sedimentation." 2nd. Edition, pp. 519-546.
15. Wilson, V., 1933. "The Corallian Rocks of the Howardian Hills (Yorkshire)." Q.J.G.S., Vol. LXXXIX, pp. 480-509.
16. Wilson, V., Hemingway, J. E., and Black, M., 1934. "A Synopsis of the Jurassic Rocks of Yorkshire." Proc. Geol. Assoc., Vol. XLV, Pt. 3, pp. 279-287.

EXPLANATION OF PLATE I.

Fig. 1. Nodular chert from the Osmington Oolite Series at Slingsby. (Ordinary Light) x 35.
This section shows a peculiar granular structure and also the presence of fragments of organisms.

Fig. 2. Same as Fig. 1 above. (Pol. Light) x 35.
Microcrystalline chalcedony predominates and the granular structure is still apparent.

Fig. 3. Spicule bearing core chert from the Hambleton Oolite Series near King Spring House, W. of Helmsley. (Ord. Light) x 40.

Fig. 4. Same as Fig. 3 above. (Pol. Light) x 40.

Fig. 5. Core chert from the Hambleton Oolite Series near Pockley, Helmsley. (Pol. Light) x 40.
Uniformly crystalline chalcedony with well developed brushes of fibrous chalcedony.

Fig. 6. Core chert from the Lower Calcareous Grit at Newgate Bank, N. of Helmsley. (Pol. Light) x 40.
Siliceous Rhaxella spicules, occasional quartz fragments and a thin vein of crystalline quartz are present.

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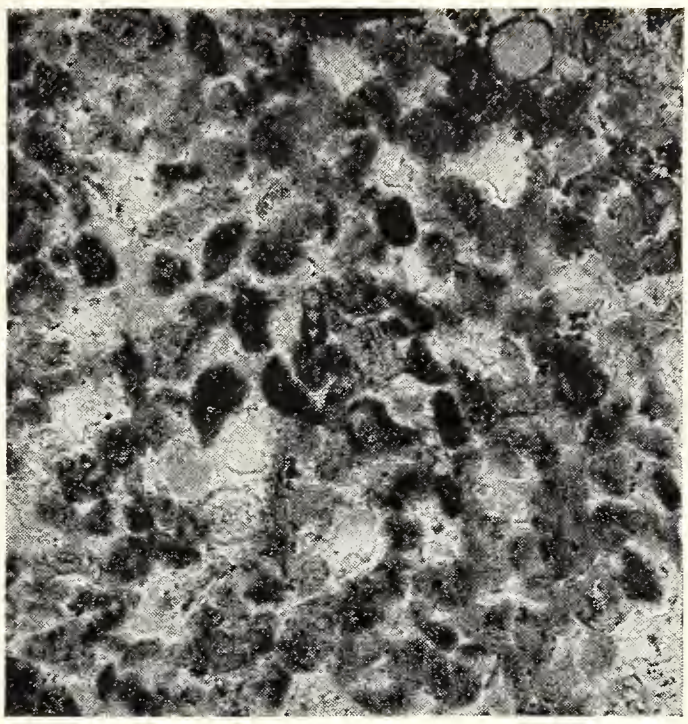

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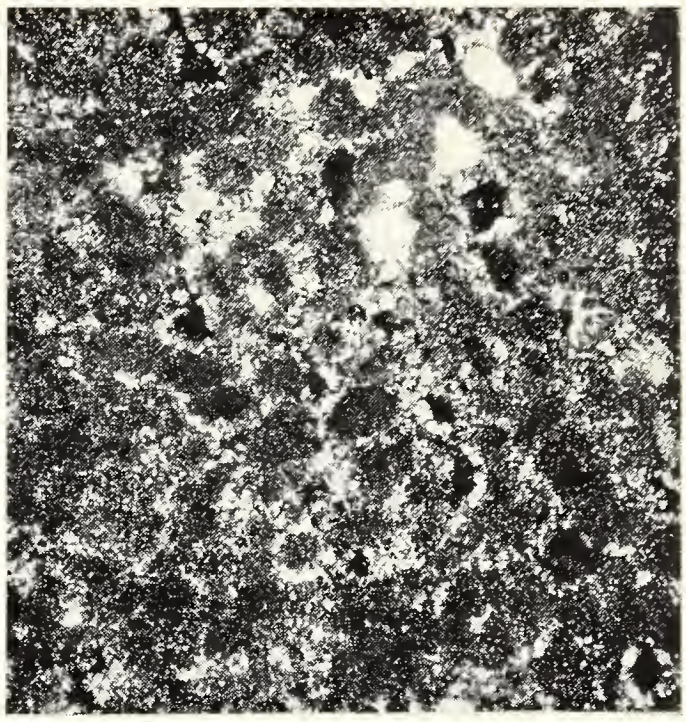

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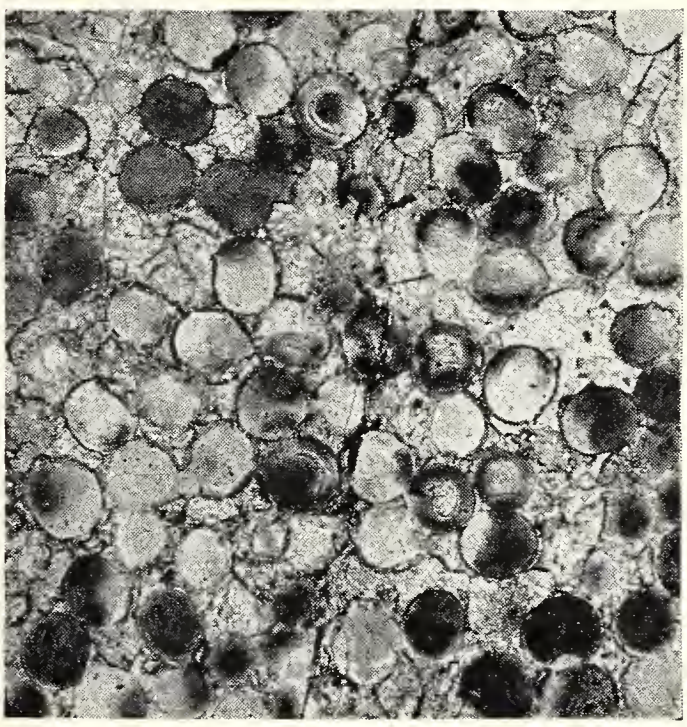

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